UNIVERSITY OF TORONTO
3 1761 01711856 3

Digitized by the Internet Archive
in 2008 with funding from
Microsoft Corporation

http://www.archive.org/details/biennialretrospe43newsuoft

54 8194 I

THE NEW SYDENHAM SOCIETY.

INSTITUTED MDCCCLVIII.

VOLUME XLIII.

New Sydenham Society Publications
A Vol. 42

BIENNIAL RETROSPECT

OF

MEDICINE, SURGERY,

AND THEIR

ALLIED SCIENCES,

FOR

1867-8.

EDITED BY

MR. H. POWER, DR. ANSTIE, MR. HOLMES,
MR. ROBERT B. CARTER, DR. BARNES,
AND
DR. THOMAS STEVENSON,

83282
16/9/07

FOR

THE NEW SYDENHAM SOCIETY.

LONDON.
MDCCCLXIX.

R
101
N49
V.2

PRINTED BY
J. E. ADLARD, BARTHOLOMEW CLOSE, E.C.

CONTENTS.

I.—REPORT ON THE PROGRESS OF PHYSIOLOGY AND THE ALLIED SCIENCES.

By Henry Power, F.R.C.S., M.B. Lond. . . PAGE 1

II.—REPORT ON PRACTICAL MEDICINE.

By Francis E. Anstie, M.D., F.R.C.P. . . 33

III.—REPORT ON SURGERY.

By T. Holmes, Esq., M.A., F.G.S. . . 193

IV.—REPORT ON OPHTHALMIC MEDICINE AND SURGERY.

By Robert Brudenell Carter, Esq. . . 338

V.—REPORT ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN.

By Robert Barnes, M.D., F.R.C.P. . . 393

VI.—REPORT ON MEDICAL JURISPRUDENCE.

By Thomas Stevenson, M.D., M.R.C.P. . . 441

VII.—REPORT ON MATERIA MEDICA AND GENERAL THERAPEUTICS.

PAGE
By Thomas Stevenson, M.D., M.R.C.P. . . 474

VIII.—REPORT ON PUBLIC HEALTH.

By Thomas Stevenson, M.D., M.R.C.P. . . . 485

INDEX 503

REPORT

ON THE

PROGRESS OF PHYSIOLOGY AND THE ALLIED SCIENCES*

DURING THE YEARS 1867 AND 1868.

BY

HENRY POWER, F.R.C.S., M.B. Lond.,

OPHTHALMIC SURGEON TO ST. GEORGE'S HOSPITAL;
EXAMINER IN PHYSIOLOGY IN THE UNIVERSITY OF LONDON.

The most important of the means by which the progress of physiological anatomy can be forwarded is improvement in the construction of microscopes, and the greatest advance that has been made in this direction of late years, with the exception of the construction by Messrs. Smith and Beck of an object-glass of only 1-50th of an inch focus, has undoubtedly been the immersion lenses of M. Hartnack, which are named from their being adapted to effect accurate definition when the glass is in direct contact with the fluid of the preparation, thus abolishing the necessity for a covering glass. Histologists will find them of great value, and their expense is moderate. The employment of glycerine, and of weak solutions of bichromate of potash and chromic acid, for the purpose of hardening the soft textures of the body, and permitting fine sections to be made, and the practice of staining them with an ammoniacal solution of carmine, by which different structures may be discriminated from each other, so strongly advocated by Dr. Beale, have been found of such use that various other fluids have been adopted with the same objects in view. M. Ranvier, for instance,† has recently suggested the use of picric or carbazotic acid. As the acid is but sparingly soluble in water, saturated solutions may be employed, and immersion for 24 hours will permit very fine sections of the soft tissues to be made. It is stated to be peculiarly applicable to those structures which ordinarily present considerable difficulty from their containing much blood, as the lungs and liver. It possesses the advantage

* In the compilation of the following Report, I have made free use of my own translations of foreign works contained in the "Half-yearly Chronicle of Physiology" in the 'Medico-Chirurgical Review;' and I must also acknowledge my great obligations to the admirably clear and condensed summaries of many other essays and pamphlets, by Drs. Rutherford, Gamgee, Fraser, and Moore, and by Mr. Turner in Humphry and Turner's 'Journal of Anatomy.'

† Brown-Séquard's 'Archives de Physiologie,' t. i, p. 319.

of not interfering with subsequent staining with carmine and ammonia. Cohnheim and Gerlach,* again, have suggested the use of chloride of gold as a staining agent. The mode adopted by Gerlach for preparing fine sections of the nervous system, as given by Lockhart-Clarke, is as follows: —The spinal cord, first divided into portions of moderate size, is hardened in a 1 or 2 per cent. solution of bichromate of ammonia, and is then transferred for 10 or 12 hours to a solution containing 1 part of chloride of gold and potassium to 1000 parts of water slightly acidulated with hydrochloric acid, when the white substance will be found stained of a pale lilac, whilst the grey is scarcely coloured. The portions of the cord are then placed in a mixture of 1 part of hydrochloric acid and 2000 to 3000 parts of water for a few minutes, then for a few minutes in a mixture of 1 part of hydrochloric acid and 1000 parts of 60 per cent. absolute alcohol. After this they are immersed for a few minutes in absolute alcohol, and are finally rendered transparent by creosote, and put up in Canada balsam. Dr. Bastian† immerses the tinted section in pure spirits of wine, then places it on a drop of carbolic acid, then adds a few drops of chloroform for 2 minutes, and finally adds a few drops of solution of Canada balsam in chloroform. Osmic acid (OsO_4) is stated by Kühne‡ to colour fat-particles of an intense brown tint, whilst other textures are only tinged of a yellow colour. Stieda, of Dorpat,§ has strongly recommended creosote and various essential oils for the same purpose, the former fluid having been first proposed by Kutschin.

BLOOD.

The principal observations made upon the blood during the past two years are as follows:—Böttcher‖ and Kühne¶ believe they have been able to demonstrate the presence of a nucleus in the blood of certain mammals, as, for instance, of the cat, the camel, and the sloth; and Rolleston and Moseley** so far confirm these statements that they state they occasionally observed nucleated cells in the two-toed sloth, and colourless cells with red nuclei in the elephant. C. J. Eberth†† again has drawn attention to the fact, noticed also by Klebs and others, of the occurrence of certain transition forms between coloured and colourless corpuscles of the blood as being remarkably conspicuous in cases of leukæmia, where many of the red corpuscles are spherical, large, and nucleated. Such blood often, as noted by Neumann,‡‡ contains minute brilliant crystals, having the form of very attenuated octohedra. Gulliver,§§ in a note on Prof. Rolleston's paper, however, without absolutely denying the possibility of nucleated

* 'Medizinische Centralblatt,' Nos. 24 and 25, 1867. See also Lockhart Clarke, 'Phil. Trans.,' 1868, p. 323.
† Humphry and Turner's 'Journal of Anatomy,' ii, p. 107.
‡ 'Physiologie Chemie,' 1868, p. 308.
§ Schultze's 'Archiv für Mikroskop. Anat.,' Heft iv, 1867.
‖ 'Virchow's Archiv,' xxxix, p. 427.
¶ 'Physiolog. Chemie,' 1868, p. 195.
** 'Quart. Journ. of Mic. Sci.,' 1867, p. 127.
†† 'Virchow's Archiv,' xliii, p. 8. 1868.
‡‡ 'Archiv f. Microscop. Anat.,' ii, Heft iv.
§§ Humphry and Turner's 'Journ. of Anat. and Physiology,' ii, p. 1.

red corpuscles in the apyrenæmata, contends that they are exceptional, and reiterates his previously expressed statement, that the red corpuscle of the apyrenæmata is quite a peculiar body, without a known equivalent or homologue. Schmidt and Schweigger-Seidel,* whilst maintaining that the granules which appear in blood-corpuscles subjected to the action of chloroform are not nuclei, as stated by Rollett, found that blood-corpuscles placed in vacuo and carefully watched presented no movements. Friedreich,† on the other hand, relates a case of albuminuria in which the red corpuscles discharged with the urine presented, at a temperature of about 60° Fahr., amœboid movements, throwing out processes and undergoing division for no less than 14 hours after expulsion from the bladder. He thinks these movements may also be found to occur in the red corpuscles of healthy and freshly drawn blood.

Experiments upon the gases of the blood have been conducted by Ludwig and Schmidt,‡ who corroborate the view generally entertained, that the carbonic acid of the blood is in part derived from the disintegration of the muscular tissue, the quantity being always greater in blood returning from muscles in action than from those at rest.

Though it is probable that much of the carbonic acid of the blood is contained in solution in the liquor sanguinis, combined with the alkalies as a bicarbonate, and in union with the phosphate of soda, yet it appears from other experiments of Schmidt§ that this gas is to a certain though small extent combined with the constituents of the blood-corpuscles. Brücke || maintains with Richardson that blood at ordinary temperature exhales a little ammonia. The latter author, however, has withdrawn his statement to the effect that the coagulation of the blood is *dependent* on the exhalation of the ammonia it contains.

In the December number of 'Pflüger's Archiv für Physiologie'¶ is contained an interesting essay, by M. Preyer, on some of the peculiarities of hæmoglobin, which is the principal constituent of the red corpuscle, and methæmoglobin. He states that up to the present time the crystalline forms assumed by hæmoglobin are only known, or at least have only been described, in 47 vertebrates, notwithstanding the facility with which this constituent of the blood can be obtained. The crystals are transparent, of silky lustre, pleochromatic (red and green), and almost always of soft consistence, and on pressure break with jagged edges, or, when the pressure is severe, into fine particles, which present Brunonian movements, and, curiously enough, like the original crystals, refract light doubly, although the blood-corpuscles themselves are only singly refractile. Though soft, the crystals are not extensile nor flexible. The specific gravity of hæmoglobin may by calculation be approximately estimated at from 1·2 to 1·3. He gives good drawings of the spectrum of hæmoglobin in the oxidized and reduced state. Oxidized hæmoglobin has the properties of a weak acid. It dissolves in very different degrees in water, accord-

* 'Sitzungsber. der Sächs Akad.,' 1867.
† 'Virchow's Archiv,' 1868, xli, p. 395.
‡ 'Centralblatt,' 1868, No. 32.
§ 'Arbeiten aus der Physiolog. Inst. zu Leipzig,' 1868, p. 30.
|| 'Centralblatt,' 1868, No. 14.
¶ Band i, 1868, p. 395.

ing to the temperature, increasing rapidly up to 60°. It is insoluble in alcohol, ether, ætherial and fixed oils, in benzole, turpentine, chloroform, creosote, amylic alcohol, and bisulphide of carbon. Though a crystalline body, it constitutes an exception to Graham's law, diffusing through parchment paper with the greatest difficulty, or not at all. It is not in the least degree fibrino-plastic. Methæmoglobin is formed from hæmoglobin by warming the recent moist crystals of the latter substance, which then become discoloured and assume a brownish-red colour, and are no longer soluble in water; with the methæmoglobin a second substance appears, of an albuminous nature, which leaves no ash on burning, and is termed globin by Preyer. He gives the effects of the action of many different substances on hæmoglobin.

M. Holm* enumerates the distinctive characters of hæmatoidin, or the colouring matter of inspissated blood, and bilirubin, or the colouring matter of bile, which have been sometimes regarded as identical in their nature. The main points of distinction are that bilirubin is weakly acid, whilst hæmatoidin is neutral. Bilirubin is insoluble in ether, hæmatoidin is soluble. Bilirubin, when in solution in chloroform, is withdrawn by alkalies, hæmatoidin is not. Städeler has shown that the colouring matter of the yolk of egg is closely allied to hæmatoidin.

As regards the development of the blood-corpuscles, Metschnikow† gives the following account, as he has followed it in fowls. On the third day of incubation the blood-corpuscles possess an irregular form, are clearly devoid of an investing membrane, but contain in their interior a round and perfectly transparent nucleus, with a few small, highly refractile particles, or nucleoli, in their interior. The corpuscles possess a faint yellow tint, and from the fourth to the sixth day present amœboid movements. They increase by fission. On the fourth day of incubation they begin to assume the natural oval form proper to the bird. On the twelfth day the corpuscles have assumed their natural flattened form, a nucleolus almost completely fills the nucleus, and about two days subsequently the previously visible boundary line of the nucleus vanishes. He therefore concludes that the so-called nucleus of the corpuscles is not a nucleus at all, but an enlarged and persistent nucleolus, which is again an evidence that the latter may play as important a rôle in cell formation as the former.

Neumann‡ notes the abundance of white corpuscles in the vessels of marrow, which he believes proceed from the peculiar cells found in that tissue, and penetrate into the interior of the vessels. He has also observed, especially in the red marrow of bones, nucleated red corpuscles exactly resembling the corpuscles of the blood of the fœtus in the early stages of its development, and he believes that a continuous process of blood-corpuscles takes place in those parts.

Considerable attention has been paid to the spectrum analysis of the blood, the results of which it is difficult to communicate without the aid of diagrams. It may, however, be mentioned that in this method of research a spectrum or ray of light, broken up into its primary colours by

* 'Moleschott's Untersuch.,' x, 1867, p. 447.
† 'Virchow's Archiv,' 1868, p. 523. ‡ 'Centralblatt,' 1868, p. 689.

refraction through a prism, is transmitted through a thin layer of blood or of solution of hæmoglobin, or of hæmatin, which may be either oxidized or deoxidized. Under these circumstances, when the spectrum is received on a white screen, certain dark striæ or absorption bands make their appearance, differing, in accordance with the chemical changes of the blood, in position or in breadth or in number, and furnishing an accurate means of determining the conditions present. A very excellent course of lectures on this subject was delivered by Prof. Roscoe at Apothecaries' Hall in the course of the summer of 1868. Gamgee* has shown that the addition of any of the nitrites to blood renders it of a chocolate colour, modifies the absorption bands in a remarkable manner, and diminishes the absorption power of the colouring matter of the blood for oxygen, whilst it fixes that which is already present. Gamgee† has also shown that when blood is placed in contact with carbonic oxide gas, as by transmitting the gas through blood, or by causing a living animal to inhale it for some time, a portion of the oxygen of the colouring matter is expelled and replaced by carbonic oxide; a definite compound is thus formed, the physical characters of which are identical, or nearly so, with those of normal blood-colouring matter, but which differs from the latter in being incapable of yielding a less oxygenized substance when treated with reducing agents.

Extensive use of the spectrum mode of analysis has been made by Dr. Thudichum for discovery and identification of various substances in the solids and fluids of the body in health and disease, of which a full description will be found in the 'Tenth Report of the Medical Officer of the Privy Council, 1868.' The sections on the colouring matter of the bile, on the colouring matter of the urine, and on alcohol in relation to the chemistry of the human body, are especially important. In the course of his observations on the last-mentioned subject he states that there are two forms of sugar—starch sugar, which turns the plane of polarization to the right; and grape or fruit sugar, which turns it to the left. The former is termed dextrose, the latter levulose, or "invert" sugar, because it reverts the polarization of the dextrose. Invert sugar can be instantaneously produced from common white cane sugar by admixture with very dry German yeast. The fluid instantly becomes syrupy, and will now precipitate oxide of copper when added to Feyling's solution. The rapidity of this action Dr. Thudichum considers as opposed to the assumption that the action of yeast in producing fermentation is due to organic life action; and a still further argument is derived from the fact that a watery extract of the yeast will have the same effect. Nevertheless, for the conversion of sugar into alcohol and carbonic acid, the yeast-cell is requisite. Diabetic sugar is dextrose.

In regard to the question whether alcohol is consumed in the body, in an important experiment made by himself, and in others made in conjunction with Dr. Dupré, of the Westminster Hospital, Dr. Thudichum has shown clearly that less than 1 per cent. of alcohol, even when taken in large quantities, is eliminated by the kidneys.

* 'Phil. Trans.,' 1868.

† Humphry and Turner's 'Journal of Anatomy,' i, p. 339.

DIGESTION.

The researches of Heidenhain * on the saliva present many points of interest; they were chiefly made on the dog, but included also the rabbit and the sheep. He endeavours to show that in the salivary glands of most animals two kinds of cells exist, one of which is clear and transparent, is unstained by carmine, and appears to contain mucus in its interior, whilst the other is granular in aspect, contains material rich in albuminous compounds, and readily becomes tinted with carmine. The former may be termed mucus-cells, the latter albuminous cells. In the rabbi the structure of the submaxillary salivary glands is very simple. The cells in the alveoli are all of the albuminous type, being soft, ill-defined, and darkly granular, possessing a nucleus which becomes strongly coloured with the carmine solution. In the dog and cat, on the contrary, the submaxillary gland is essentially a mucus-gland, the cells in the interior of the villi being large and transparent, and developing continuously, so that, as successive series break down to form the mucus, their place is supplied by others. Near the periphery of the alveoli a few albuminous cells are to be found. The submaxillary gland of the sheep presents the two cell forms in its acini, but the granular albuminous cells are relatively far the most numerous. The corresponding gland in man agrees with that of the dog and cat in structure, and is therefore essentially a mucus-gland. Heidenhain found that the nature of the saliva discharged on irritation of the chorda tympani corresponded to the variations in the structure of the cells observed in the glands. Thus, in the rabbit the chorda tympani saliva was thin and watery, decidedly alkaline, free from mucin, and containing a solid residue, amounting to 1·239 per cent. In the case of the dog it contained mucin, with a very small proportion of albuminous compounds. In the sheep the amount of proteids was more considerable than in the dog, whilst the proportion of mucin was very variable. In the dog the per-centage proportion of solid constituents diminished with the duration and rose with the strength of the stimulus by which the nerve was excited; and he found that mucin formed the greater part of the salivary solids. The saliva discharged on irritation of the sympathetic is less watery than that obtained by excitation of the chorda tympani. Heidenhain considers he has positively shown that by excitation of certain nerves processes and metamorphoses may be induced which occasion cell formation.

Eckhard † finds that the salivary glands are not under the influence of the same nerves in different animals; and in the sheep the parotid gland does not appear to be under the control of any cerebro-spinal nerve, since its secretion is poured forth uninterruptedly, and is not augmented by irritation of the fifth, the portio dura of the seventh, nor of the sympathetic, in this respect differing remarkably from that of the horse. A different conclusion has been arrived at by G. Bidder,‡ who has observed that in the sheep irritation of the upper part

* "Essays on the Saliva," in the 'Studien des Physiol. Instituts zu Breslau,' 1868 p. 1.

† 'Henle und Pfeuffer's Zeits.,' xxix, 1867, p. 74.

‡ 'Reichert's Archiv,' 1867, No. 6.

of the cervical sympathetic increases the secretions of the parotid; and v. Wittich,* who has also noticed the same fact, attributes it to increased secretory activity of the gland. Bidder is disposed to agree with him, since, as a consequence of the irritation, an increased flow of blood through the gland occurs, with augmented pressure in the veins and pulsation in these vessels. Eckhard,† however, regards the increased discharge as merely the result of the expression from the gland, by contraction of their muscular walls, of the store of saliva which has accumulated in the ducts.

In a paper by Dr. F. Losch ‡ is detailed a series of investigations made to determine whether the *Leptothrix buccalis*, a form of fungus commonly or constantly appearing in the saliva, exercises any influence in the conversion of starch into sugar, and replies decisively in the negative. The converting agent is the ptyalin.

The act of deglutition has been carefully investigated by Dr. Moura,§ who generally corroborates the observations of Dzondi and Czermak. In regard to the deglutition of liquids, he found that on swallowing ink the parts tinted were the whole internal surface of the mouth, the velum palati, uvula, pillars of the fauces, the external or anterior surface of the epiglottis, the pharynx, and the posterior surfaces of the cricoid and arytenoid cartilages. No staining occurred of the vestibule of the larynx, except close to the margin of the epiglottis.

In a long paper contained in 'Moleschott's Untersuchungen,'‖ Schiff endeavours to show that in the act of vomiting an active muscular contraction takes place, by which, in the moment immediately preceding the ejection of the contents of the stomach, the cardiac orifice is rendered patent; and he cites in favour of his view an observation long ago made by Tantini, showing that no vomiting can be induced in the well-known experiment of Magendie unless the parts about the cardiac orifice of the stomach are first cut away; and also an observation of Rühle, showing that if a manometer be inserted into the stomach of an animal, and vomiting be excited by the injection of tartar emetic into its veins, at the moment just previous to the ejection of the contents of the organ the mercury, instead of rising, as it might naturally be expected to do, falls. This observation had not escaped Valentin, who attributed the fall of the mercury to negative pressure, occasioned by the rapid discharge of fluid from the stomach. Schiff, however, regards it as due to the contraction of a definite set of muscular fibres, effecting an active dilatation of the cardia, since it precedes the pressure exerted by the abdominal walls, and these fibres are the longitudinal fibres of the lower part of the œsophagus.

The views of Letzerich respecting the absorption of fats through special absorbing cells situated on the villi, described in the last Report, have led to much investigation and discussion. Sachs, who worked under the superintendence of Chrzonszczewsky,¶ strongly opposes Letzerich's statements. He considers the peculiar open-mouthed beaker or port-wine-glass cells of Letzerich as altogether artificial products, resulting from the action of reagents on the delicate epithelial cells of the villi; and he was

* 'Virchow's Archiv,' xxxvii and xxxix. † 'Beiträge,' iv, Heft ii, 1867.
‡ 'Untersuch. aus dem Physiolog. Laborat. in Wurzburg,' Leipsic, Dec. 1868.
§ Robin's 'Journal de l'Anatomie,' 1867, p. 157.
‖ Band x, 1867, p. 353. ¶ 'Virchow's Archiv,' xxix, p. 493.

not able in any instance to discover the plexus of fine vessels said by Letzerich to be situated between the central lacteal and the absorptive organs, and to be a means of communication between them. Offinger,* whilst admitting the presence of port-wine-glass cells, considers they result from gradual changes taking place during life in the ordinary cylindrical epithelium covering the villi, as various intermediate forms may be seen. Arnstein and Knauff† express a nearly similar opinion. Th. Eimer‡ and M. Schultze§ deny that the port-wine-glass cells of Letzerich are absorbing cells, but regard them as the agents for secreting the intestinal mucus.

The power of the pancreatic fluid to effect the digestion of albuminous substances seems to be now fully established, and has been corroborated by the experiments of Kühne,‖ Diakonow,¶ Fudakowski,** Schwerin,†† and H. Senator.‡‡ Besides peptone and parapeptone, leucin, and perhaps tyrosin, are generated. According to Kühne, it is not necessary, as Henle believed, that the fluid should have an acid reaction for digestion to take place. It does not appear improbable that, as S. Radziejewski§§ endeavours to show, the process of saponification may play a more important part than is usually attributed to it in aiding the absorption of oleaginous substances. Radziejewski believes he has proved that *soaps* can be absorbed and can again be converted into fat in the organism.

Liver.—Some attention has been paid to the structure of the liver, which, notwithstanding the carefully made injections of Dr. Beale, does not appear to be even yet fully elucidated. Accolas,‖‖ in opposition to almost all recent inquirers, maintains that the biliary ducts end in blind extremities at the surface of the acini of the liver. Kölliker,¶¶ on the other hand, coincides with Hering in believing that the ultimate biliary ducts penetrate into the interior of the lobuli, and there form a system of communicating tubes, which he describes as presenting a remarkable type of structure. They possess no membrana propria, but appear as channels, formed by the apposition of grooves excavated along the sides of the hepatic cells, the cell-wall of which, extremely delicate elsewhere, is here slightly thickened. Each cell, therefore, on this view, forms part of the wall of several tubes, whilst each tube is bounded at any part of its length by two cells. The capillary vessels chiefly occupy the angles of junction of three or more secreting cells.

Biliary colouring matters.—Max Jaffé*** has investigated spectroscopically the fluid resulting from the action of nitric acid on bile, and describes a broad absorption band between *C* and *D*, but nearer the latter, which divides on dilution into two, while a third subsequently appears between

* 'Reichert's Archiv,' 1867, p. 337.
† 'Virchow's Archiv,' xxxix, p. 442 and p. 527.
‡ Pamphlet, 1867.
§ 'Archiv f. Mik. Anat.,' iii, p. 204.
‖ 'Archiv f. Path. Anat. u. Physiol.,' xxxix, p. 130.
¶ Hoppe Seyler's 'Med.-Chem. Unters.,' Heft ii, p. 241.
** 'Centralblatt,' 1867, No. 35.
†† Dissert., Berlin, 1867.
‡‡ 'Virchow's Archiv,' xliii, p. 358.
§§ Ibid., p. 268.
‖‖ Thesis, Strasbourg, 1867.
¶¶ See Humphry and Turner's 'Journal of Anat.,' ii, p. 163.
*** 'Centralblatt,' 1868, No. 16.

b and *F*. The broad band is caused by the presence of a blue colouring matter.

Koschlakoff and Bogomoloff* state that it is well known that the resinoid acids of the bile give a beautiful red colour with sulphuric acid and sugar (Pettenkofer's reaction). Solutions of albumen give the same colour with the same reagents. Hitherto it has been impossible to distinguish between the two. They have overcome this difficulty by examining the solutions spectroscopically. The biliary solution treated with sulphuric acid and sugar, and moderately concentrated, exhibits four absorption striæ—1, the strongest and best defined, at E; 2, in F; 3, between D and E, but nearer F; and 4, close to D. Secondly, the reddened biliary solution is dichrotic. By reflected light it is green, by transmitted light cherry-red. The fluid must not be too concentrated, and may be diluted with acetic acid. The reactions of albumen, when treated with SO_3 and sugar, are, that its solutions present only one absorption stria between E and F, and that it has no dichroism. The albumen in Bright's urine gives no colour with SO_3 and sugar, unless first prepared with nitric acid or by boiling.

Thudichum† has made researches on the colouring matter of the bile. He obtained bilirubin, a crystallizable substance, having a composition $C_9H_9NO_2$, and biliverdin, a non-crystallizable substance. From the latter he obtained bilipurpin and biliflavin.

Lymphatics.—The most interesting observations that have been made in regard to the lymphatics are probably those of Schweigger-Seidel and Dogiel,‡ who endeavour to show that in frogs, lizards, and blind-worms, the great serous cavities, as, for example, the pleuræ and peritoneal cavities, are to be regarded as merely enlargements or dilatations of the lymphatics, with which they communicate freely by openings between the epithelial cells lining their interior. The average size of the openings is about 1-800th of an inch, and their usual distance from one another is about 1-200th of an inch. On the internal surface of the cavity, and close to the openings, the epithelial cells were generally ciliated.

Dybkowsky§ describes the distribution of the lymphatics of the pleura in the dog. In the costal pleura they are only found over the intercostal spaces, and not over the ribs, and this, he thinks, is connected with the fact that absorption takes place as a result of the opposed action of the elasticity of the lungs and the contraction of the intercostals, by which the open mouths of the lymphatics, similar to those above described by Schweigger-Seidel and Dogiel, are distended, and thus permit the entrance of particles of appreciable size, as those of prussian blue or carmine, when injected into the cavities.

Afonassiew‖ doubts the statements of the last-named observers respecting the presence of free openings, and considers that the lymphatics commence in the delicate network formed by the processes given off by the connective-tissue-corpuscles. The observations of Wharton Jones ('Proceed. of the Roy. Soc.,' April, 1868) on the movements of the

* 'Centralblatt,' 1868, Aug. 1, p. 529. † 'Journ. f. pract. Chemie,' civ, 193, 222.
‡ 'Arbeit. aus der Physiolog. Anstalt zu Leipzig,' 1867, p. 68.
§ 'Ludwig's Arbeiten aus der Physiol. Anstalt zu Leipzig,' 1867, p. 40.
‖ 'Virchow's Archiv,' July, 1868.

lymphatic hearts in the eel and frog are of much interest. He describes their intermittent character, the propulsion of their contents into the vein, and the consequent momentary interruption to the current of blood in the latter. The fibrils of which these hearts are composed may be termed unstriped, rhythmically contractile, muscular fibrils.

ABSORPTION.

Demarquay,* like Savory, found that iodide of potassium was more quickly absorbed by the rectum than by the stomach. The experiments of Ritter,† Clemens,‡ and others, show that but little, if any, absorption takes place through the skin when the body is immersed, even for considerable periods of time, in baths containing various salts, such as iodide of potassium and the sulphates of soda and of iron, in solution. After the infrication of these, however, in the form of ointment, their presence can readily be demonstrated in the various secretions.

M. Ch. Hoffmann § arrived at different results. He found that various salts and vegetable infusions penetrate certainly, but very slowly, into the body by the external integument, and that it is only when the blood and other liquids are saturated with them that they are discharged from the organism. He believes that all medicaments are not absorbed to the same degree by the skin, and that the contradictory results obtained up to the present time show only that the experiments have not been conducted for sufficiently long periods of time. M. Hoffmann took sixteen baths or more, carefully washing his skin every time, the experiments extending over six weeks. In one of his experiments he used 300 litres of water, in which 250 grammes of digitalis leaves had been infused.

CIRCULATION.

Heart.—The causes of the first sound of the heart have been investigated by J. Dogiel and C. Ludwig.‖ These authors exposed the heart in dogs under the influence of woorara, and kept up artificial respiration; passed a ligature round each of the vessels entering and emerging from the heart, and tightened them in the following order:—1. Superior vena cava. 2. Inferior vena cava. 3. Pulmonary arteries. 4. Pulmonary veins. Lastly, after slight squeezing of the heart, the aorta. The heart, thus rendered nearly bloodless, was excised, and suspended in a funnel-shaped vessel filled with defibrinated blood in such a manner that it did not come into contact with the sides. The vessel was closed below with a thin lamina of india rubber, and enclosed in a caoutchouc tube, to which, by means of a glass tube, a stethoscope was introduced. With the aid of this last there was heard at each systole, when this continued regularly, a distinct sound, which was distinguishable from the ordinary first sound of the heart only by its feeble intensity. If the cardiac movements were performed irregularly the sound disappeared. In a second series of researches the heart was not ligatured and excised, but remained *in situ*, whilst the ligatures were only tightened in the above-mentioned order to

* 'L'Union Médical,' Jan. 1867.
† 'Archiv f. Wiss. Heilk.,' iii, p. 103, 1867.
‡ In idem, p. 211.
§ 'Comptes Rendus,' 1867, p. 722.
‖ Sächs, 'Akad. Sitz. Berichte,' 1868, p. 89.

such a degree that the heart was empty. If the beats were irregular the experiment could be commenced anew by readmission of the blood. Auscultation was accomplished by the direct application of stethoscopes made of various material to the surface of the heart, and gave in all instances the weaker sound above described. Sometimes the second sound of the heart was also heard if the heart contained any blood, and the aorta was not to some extent left patent. The authors conclude from these researches that the main cause of the first cardiac sound is the muscular sound, though, perhaps, under ordinary circumstances, vibrations of the valves are commingled with it. The fact that up to the present time no sound has been perceived in the single contractions of muscular tissue is certainly not opposed to the possibility of such sound occurring in the case of the heart.

The result of an important series of observations on the influence exercised by the movements of respiration on the circulation of the blood have been communicated by Dr. Burdon Sanderson,* in which he observes that such influence is in ordinary respiration entirely of a mechanical nature, and that the act of inspiration, being accompanied by an increased flow of blood to the heart, immediately induces increased frequency and force of the cardiac beats, the former effect resulting from shortening of the diastole; the latter from increased vigour of the systole, which exhibits itself in increased pressure in the vessels. In expiration, on the contrary, the beats of the heart are slower, the diastole longer, and the arterial pressure less.

M. E. Cyon† has made two series of researches to determine the influence of temperature and of carbonic acid upon the action of the heart. The hearts of frogs were employed, which, after being removed from the body, were connected with an apparatus by which the serum of rabbits' blood could be driven through their vessels, maintaining their activity for from 24 to 48 hours. The serum could be transmitted charged either with carbonic acid or with oxygen. His experiments showed that serum saturated with carbonic acid produced sudden stoppage of the heart's action as soon as it came into contact with the internal surface of the cavities. This stoppage was due to excitation of the terminal branches of the vagi, for—(1) It occurred suddenly in diastole. (2) Isolated contractions could be induced during the stoppage by reflex irritation of the heart. (3) The movements were suddenly resumed after the expulsion of the serum saturated with CO_2. (4) The same peculiar amplitude of the contractions, interrupted at first by long periods of repose, was observed as after excitation of the vagi and stoppage of the heart.

Arterial system.—M. Claude Bernard ‡ states that there exists in certain organs, and particularly in the glands, two modes of communication between the arteries and the veins—first, through capillary vessels, and secondly, through certain small arteries which inoculate directly with the veins. These last, which are eminently contractile under nervous influence, serve to regulate the local circulation of the organ without dis-

* 'Phil. Transact.,' 1867, p. 571.

† "Uber den Einfluss des Temperaturaenderungen," &c., 'Ber. d. Sachs Gesell. der Wiss.,' July, 1866, and 'Comptes Rendus,' 1867, p. 1049.

‡ 'Rapport sur le Progrés de la Physiologie,' 1867, p. 66.

turbing the general circulation of the body. In the liver similar anastomoses may be seen between the vena portæ and the subhepatic veins; and M. Sucquet* has shown that similar anastomoses exist in man between the arteries and the veins of the peripheric circulatory system. Aronheim† notices that the addition of 1 per cent. of common salt, or chloride of potassium, retards, whilst 3 per cent. accelerates, the movement of the blood through the vessels; in the latter case because it causes contraction of the blood-corpuscles. No change was effected on fluids free from corpuscles by such addition.

MM. Ainser and Lohe‡ made some experiments to determine the influence of irritation and of section of the vagi on the rapidity of the circulation in the dog. They found that, under normal conditions, the duration of the circuit was above 18 or 19 seconds, the heart beating about 24 or 25 times. Excitation of the vagus occasioned reduction of the frequency of the pulse and marked prolongation of the period in which the circuit was performed, occupying in one or two instances as long as 60 seconds. Section of the vagi after the lapse of a few seconds produced little effect.

Chr. Lovén§ has shown that by irritating the sensory nerves of a part a reflex influence can be exerted on the vaso-motor nerves, apparently of an inhibitory nature, effecting the diminution of their action, and consequently leading to dilatation of the vessels. Thus, if the auricular nerve in rabbits, or the dorsal nerve of the foot, be irritated, even in animals poisoned with woorara, in whom, therefore, no struggling occurred to confuse the result, the corresponding arteries—as the auricular and saphena—underwent, in the course of from 4 to 6 seconds, a sudden and extraordinary dilatation, which quickly attained its maximum, and again, a few seconds after the removal of the electrodes, completely disappeared. Coincidently with this the frequency of the cardiac beats invariably fell, which he attributes to a reflex influence, exerted through the pneumogastric, since it failed to occur when these nerves were divided.‖

Veins.—M. Jacobson¶ has given the results of a series of experiments undertaken upon sheep, with a view to determine the pressure exerted in the veins during normal respiration. They are as follows:

In the left innominate vein	—	0·1
„ right jugular	+	0·2
„ right subclavian	—	0·1
„ left jugular	—	0·1
„ left subclavian	—	0·6
In a brachial vein, opening into the last-named, close to the origin of the innominate vein	—	1·
In the external facial vein	+	3·
„ internal „	+	5·2
„ brachial vein	+	4·1

* 'De la Circulation dans la Tête et dans les Membres de l'Homme,' 1860.

† 'Hoppe-Seyler's Med.-Chem. Untersuch.,' Heft ii, 265.

‡ 'Henle und Meissner's Zeits. f. rat. Med.,' 1868, xxxi, p. 33.

§ 'Ludwig's Arbeit aus der Physiolog. Anstalt zu Leipzig,' 1867, p. 1.

‖ For a good account of the sphygmograph and its application to pathology, the reader is referred to the little work of Dr. Burdon Sanderson, Lond., 1867.

¶ 'Reichert's Archiv,' 1867, p. 224.

In a branch of the same	+ 9·
In the crural vein	+ 11·4

The pressure always rose with muscular exertion. No respiratory influence could be observed beyond the crural, brachial, and facial veins, and not always in these.

RESPIRATION.

Cleland* opposes the views enunciated by Hutchinson, to the effect that the external intercostals, and those portions of the internal which are placed between the costal cartilages, act only as elevators of the costal arches, the remaining internal intercostals acting only as depressors. He appears to regard both the external and the internal intercostals as muscles of inspiration. The cause of the respiratory movements has commonly been referred either to the presence of carbonic acid in the air contained in the air-vessels, or in the blood acting as a stimulus on the extremities of the pneumogastric nerves. Pflüger† shows that, whilst an increase of carbonic acid acts as a stimulant either on the extremities of the vagus or on the medulla oblongata, increasing the depth and frequency of the respirations, the essential condition affecting the respiratory movements is a deficiency of oxygen, the movements becoming feeble in proportion to the amount of oxygen introduced into the system, till, if it rise above a certain amount, they may cease altogether, whilst they become stronger in proportion to the diminution of the supply of this gas.

In a later paper‡ he adduces new evidence to show that dyspnœa is essentially occasioned, not by increase of carbonic acid in the blood, but by deficiency of oxygen; attributing the effect, not to the direct influence of the absence of oxygen on the nervous system, but to the accumulation of certain easily oxidizable materials in the blood which the oxygen present is insufficient to burn off. He admits, however, that the presence of an excess of carbonic acid in the blood also tends to produce dyspnœa. Pflüger, nevertheless, details an experiment, in which it is rather the *presence* than the deficiency of oxygen or excess of carbonic acid which appears to excite the nervous centres. It is as follows :—If the belly of a pregnant rabbit be laid open, the fœtus are seen lying without respiratory movements; on detaching the placenta regular respirations do not, as might be expected, occur, but only occasional efforts at inspiration, especially if the animals be pinched, and they gradually die. If, however, the membranes be opened, so that when the inspiratory efforts are made air enters the lung, lively respiratory movements occur, which soon become regular. Here it would appear that the entrance of oxygen constitutes the stimulus that excites the respiratory acts.

Burkart § states that an inhibitory influence may be exerted on the respiratory movements by excitation of certain sensory fibres which course centripetally in the recurrent laryngeal nerve. Absolute stoppage of the respiratory movements may be induced by sufficiently strong irritation of these fibres.

The influence of the inhalation of various gases on the respiration has

* Humphry and Turner's 'Journ. of Anat. and Phys.,' i, 1867, p. 209.

† 'Archiv f. gesammte Physiologie,' i, 1868, p. 61.

‡ 'Pflüger's Archiv d. Gesammte Physiol.,' i, p. 106. § Id., p. 278.

led Hermann * to divide them into—(1) Indifferent gases, amongst which he includes nitrogen, hydrogen, and perhaps carburetted hydrogen, which, when mingled with oxygen, can be respired for a considerable period without harm, though when breathed in a state of purity they induce dyspnœa, convulsions, and asphyxia. (2) Irrespirable gases, which can only be breathed in small quantities, on account of their occasioning spasm of the glottis, as carbonic acid, hydrochloric, hydrofluoric, and sulphurous acid gases, nitric peroxide gas and ammonia; and, lastly, poisonous gases, some of which, as sulphuretted, antimoniuretted, phosphuretted, and arseniuretted hydrogen and nitrous oxide gases, oxidize themselves at the expense of the oxygen of the blood, and thus induce dyspnœa, convulsions, and asphyxia; whilst others, as carbonic oxide and hydrocyanic acid, appear to replace oxygen in its combination with hæmatin. Nitrous oxide and olefiant gases have a complicated action, inducing narcosis.

The question of the seat of the processes of oxidation which lead to the formation of carbonic acid, left undecided by the opposite results obtained by MM. Estor and St. Pierre and M. Hirschmann, has not yet been decisively settled.

M. Hoppe-Seyler † maintains that the true seat of the processes of oxidation is not in the blood itself, but results from contact with the various organs and tissues of the body; for it may be shown, first, that living blood compelled for a short time to remain in a living artery assumes the characters of venous blood; secondly, that the same change also occurs with defibrinated blood; but, thirdly, that this does not occur if the blood be introduced in the artery in a small glass tube; that, fourthly, a piece of living artery immersed in defibrinated blood occasions venous discoloration of the blood in its immediate neighbourhood; and, lastly, that no materials can be withdrawn from the vessels by means of a diluted solution of chloride of sodium, which can render the blood venous.

Mr. Heaton, in an able paper,‡ adduces valid chemical considerations to the effect that the greater portion of the oxidizing processes must of necessity occur in the blood whilst still retained within the vessels, since the amount of oxygen contained in the carbonic acid eliminated is greater than can by any reasonable possibility be supposed to pass out of the vessels, with the lymph or liquor sanguinis, into the interstices of the tissues. It may be remarked that M. Hoppe-Seyler's experiments do not appear to be incompatible with Mr. Heaton's theory. M. Fick, however,§ is of opinion that the substances free from nitrogen, which are consumed in the development of the muscular force, constitute part of the proper muscular tissue, and complains that he has been misrepresented in saying that the oxidation takes place in the blood-vessels.

Animal heat. — Jürgensen ‖ endeavoured to ascertain the diurnal variations of temperature in three healthy persons, by inserting a thermometer, to the depth of about two inches, into the rectum, and reading off the indications every five minutes throughout the day. He found the mini-

* 'Physiologie,' 1868, p. 151.
† 'Medicin.-Chemisch Untersuch.,' Berlin, 1867, p. 295.
‡ 'Lond. Phil. Mag.,' 1867, p. 341.
§ 'Virchow's Jahresbericht' for 1867, p. 80.
‖ 'Deutsches Archiv f. Klin. Medicin,' iii, p. 166.

mum to be from 1.30 a.m. to 7.30 a.m. It then slowly rose, with some fluctuation, till 4 p.m., from which time till 9 p.m. it remained at its maximum. The mean diurnal temperature of all the experiments was, as nearly as possible, 100° F. (99·96°). The difference between the maximum and minimum in the older person was from 1·8° to 2·7° F., whilst in the younger and more excitable it amounted to 3·6° F. As regards the influence of variations in diet, he found that fasting throughout the whole day made no difference to the minimum and maximum periods, but the mean daily temperature fell about $\frac{1}{2}$° F. When, however, the period of fasting was protracted to sixty-two hours the mean temperature was exalted, and there was no period of marked depression. The ingestion of food caused an increase in temperature, but the ordinary daily fluctuations were distinctly perceptible. No reciprocal relation was observed between the amount of urea discharged per diem and the mean temperature of the body.

Folet* notes that in most cases of hemiplegia the temperature of the axilla of the paralysed side is about 1·8° F. above that of the healthy side; but when atrophy follows the hemiplegia the temperature falls.

Frese† and Kettler‡ show that, whilst the injection of small quantities (3j or 3ij) of cold water or of healthy blood into the veins of an animal produces little alteration in the animal temperature, the injection of the blood of animals suffering from inflammatory affections, as pleurisy, pneumonia, or enteritis, quickly causes an elevation of 3° or 4° F., which lasts for several days, and brings on an attack of fever. A small quantity of pus produces the same effect.

M. J. S. Lombard,§ in experiments made to determine the influence of respiration on animal heat, arrived at the following conclusions:—1. That augmentation of the frequency and extent of the respiratory movements for ten minutes may cause a fall of temperature amounting to 2° F. (1·11° C.) over the radial artery. 2. When the respiration is suspended at the end of an ordinary or full inspiration, the temperature over the radial artery can descend from 1-100th to 1-1000th of a degree Cent. in the space of a minute or a minute and a half, the fall commencing some seconds after the commencement of the suspension of the respiration. 3. The temperature of other parts of the forearm besides those superjacent to the radial artery is either not at all or only transiently depressed by suspension of the respiration after an ordinary or full inspiration. 4. The cause of the fall of temperature when the number and extent of the respirations are augmented is in a change of the circulation. The sphygmograph showed in these cases a diminution of the tension and of the force of the pulse, and an augmentation of its frequency. It is not improbable that these changes of the circulation are, up to a certain point, the effect of purely mechanical causes, but they appear, at least in part, to be due to a direct modification of the heart's action by a nervous influence. 5. The cause of the fall of temperature when the breath is held depends also on changes in the circulation. The sphygmograph shows that the

* 'Gaz. Hebdomad.,' 1867, Nos. 12, 14.
† 'Dissert. on the Ætiology of Fever,' and 'Virchow's Archiv,' xl, p. 302.
‡ Idem, xli, p. 542.
§ 'Brown-Séquard's Archives de Physiologie,' 1868, i, p. 479.

tension augments, and that the force of the pulse diminishes, whilst its frequency augments. The increase of tension is due to an obstruction in the thorax, on the right side of the circulatory apparatus. As the result of this obstruction there supervenes a general venous congestion, which produces an analogous state in the arteries. With the increase of tension there is a diminution in the quantity of blood received in a given time in each part, although there is an augmentation of the absolute quantity of blood. The depression of temperature is due to the arrival of a smaller quantity of blood by the radial artery. 6. The non-depression or even elevation of temperature in those parts which are not near the radial artery is due to the fact that these parts depend for their temperature upon the state of the veins and of the capillaries, and that these vessels, being very distensible, gorge themselves with blood when an obstruction exists on the venous side of the circulation in the thorax, and that the total quantity of this fluid more than compensates (at least temporarily) for the diminution in the quantity of new blood arriving in a given period. 7. It is evident that the blood cannot ordinarily be cooled as much as is usually thought during its passage through the lungs, since the suspension of all the causes of cooling which exists in these organs does not raise the temperature over the radial artery more than 1-2000th of a degree Cent.

Lombard * further finds that intellectual exertion of any kind, even the transitory excitement of the attention, causes an increase in the temperature of the head. Severe mental work raised the temperature from one fourth to one half of a degree Cent. The changes of temperature were most conspicuous in the occipital region, and were estimated by means of a very delicate thermo-electric apparatus.

Dr. Schuster,† from investigations on the temperature of the rectum in baths of various kinds (hot-water, steam, and douche), found that immersion of the body in a bath of about 100° caused elevation of the temperature. In hot baths the temperature of the rectum often rose above the highest temperature of the baths. The pulse rose proportionately to 108—112, the normal being 72. The temperature fell continuously after the bath.

NERVOUS SYSTEM.

M. Oscar Liebreich,‡ from researches conducted in the chemical laboratory of M. Wurtz, has shown that the brain and nerves contain, in abundance, a definite and crystallizable substance, soluble in alcohol and ether, precipitable on boiling with baryta, and yielding sugar on treatment with sulphuric acid, which he has termed protagon. This he believes plays an important physiological *rôle* in nervous action. It possesses a complex constitution, and becomes converted, under the action of alkalies, into a basic substance capable of forming definite salts with acids, and which he has termed neurine. This substance can be obtained from the brain, where it exists naturally. From its composition it enters into a class of basic substances which have been formed for some years past by making oxide of ethylene (a combination of oxygen with olefiant gas)

* 'Archiv de Physiologie,' Brown-Séquard, i, 670.

† 'Virchow's Archiv,' xliii, p. 60, 1868.

‡ 'Revue des Cours Scientif.,' v, p. 648, 1868.

react on ammonia or on analogous bodies. By slightly modifying this method neurine has been artificially formed. It was at first believed to contain phosphorus; but subsequent investigations in the laboratory at Tübingen show that the presence of this element is due to the admixture of a substance termed lecithin, which contains 3·8 per cent. of phosphorus.

M. Marey,* in speaking of the rapidity with which nervous impulses are propagated, remarks that, whilst Helmholtz assigns the value of 24·04 mètres per second, he himself, taking every possible precaution which science has yet suggested, found that in certain cases it did not exceed twelve to fourteen mètres per second. He adds that this seems opposed to the idea of the identity of nervous and electrical forces, but that M. Gangain has lately observed electricity travels still more slowly through a moistened thread, and that, consequently, the idea of their identity is not to be too suddenly discarded.

Baxt finds† the rapidity of transmission of impulses through the sensory nerves to be, on the average, 33·9005 mètres per second.

The department of physiology which has, perhaps, received most attention during the last two years has been the innervation of the heart; and MM. Cyon and Ludwig, to the former of whom the French prize for experimental physiology has been decreed, have been the most successful, as well as most original, investigators in this important field of research, though several valuable series of researches have been contributed on the same subject by the band of workers whose results have been published by v. Bezold, under the title of 'Researches undertaken in the Physiological Laboratory of Wurzburg.' The observations contained in the report of the Commission of the Academy of Sciences appointed to examine the statements of M. Cyon furnish so clear an account of the discoveries that they will here be given in a condensed form. It may be premised that in 1863 M. v. Bezold believed he had shown that the spinal cord acted directly on the heart, since its section between the occiput and the atlas produced retardation of the cardiac beats and diminution of the pressure of the blood in the larger arteries. This view was opposed by MM. Ludwig and Thiry, on the ground that irritation of the spinal cord, separated from the encephalon, continued to occasion diminution of the blood-pressure, notwithstanding that all the cardiac nerves connecting the heart with the spinal cord had been destroyed by the galvano-caustic method; and they showed that simple compression of the aorta was sufficient to augment the pressure in the vessels; hence they conceived that excitation of the inferior cut surface of the spinal cord acted primarily on the peripheric circulatory system through the agency of certain vaso-motor or vascular nerves, and only exerted a secondary or indirect influence on the central organ of the circulation. To MM. Cyon and Ludwig belongs the merit of having traced the channel by which this effect is produced, and they have shown it to be through the splanchnics. These nerves are clearly the most important vaso-motor nerves in the body, and exercise control over the widest system of vessels. On dividing the splanchnics the effect is identical with that resulting from the division of the spinal

* 'Revue des Cours Scien.,' iv, 1867, p. 212.

† 'Henle und Meissner's Bericht,' 1867, p. 473.

cord between the occiput and the atlas, the blood-pressure in the vessels rapidly falling, owing to the paralysis of the vaso-motor nerves and the consequent enlargement of the vessels. If, on the contrary, the peripheric cut extremities of the splanchnics are irritated, the vaso-motor nerves effect the contraction of the vessels, and the pressure of the blood in their interior rises. Further, if after the division of the splanchnics irritation be applied to the inferior cut surface of the spinal cord in the occipito-atloid region, either no effects are observed or they are very inconsiderable; hence it is obvious that the increase of pressure in the vessels is not due to the direct influence of the nervous system on the heart, causing that organ to contract with unusual energy. But besides the increase of pressure in the vessels an influence is exerted upon the heart, and this influence is apparent by the increase in the frequency of its beats. The question arises, is this the result of the direct action of the nervous system on the heart? M. Cyon answers in the affirmative, and has shown by experimental evidence that there is a special cardiac accelerator nerve, which emerges from the spinal cord with the third branch of the inferior cervical ganglion. And this is not the only point that M. Cyon has elucidated. It has long been known that the interior of the cavities of the heart is sensitive, and M. Claude-Bernard showed that the contact of a thermometer-bulb with the internal surface of the ventricles caused considerable acceleration of the movements, which can only be explained by attributing it to a reflex action on the accelerator nerve. But besides this M. Cyon has shown that the sensory nerves of the heart can exert a reflex action on the motor nerves of the blood-vessels, effecting dilatation of their calibre and diminution of the blood-pressure. This channel or circuit he carefully examined, and arrived at the following conclusion:—That in the rabbit there exists a nerve which usually arises by two roots—one from the trunk of the pneumogastric, the other from the superior laryngeal nerve. It descends by the side of the carotid artery and the sympathetic nerve, from which it is always distinct. On entering the chest it communicates with branches from the first thoracic ganglion, and is lost in the substance of the heart, or rather in the dense connective tissue between the aorta and pulmonary artery. If this nerve be divided as it descends in the neck, irritation of the lower cut surface is followed by no observable phenomena; whilst irritation of the upper cut surface occasions pain, and induces a diminution of pressure in the carotids amounting to from five to six centimètres as measured by the manometer, and this even in animals under the influence of woorara, when no movements were present to obscure or modify the result. That its agency was not exerted directly on the heart was shown by its continuing even when all the cardiac nerves were destroyed by the galvano-caustic method, and hence it seems to be certain that the reflex action is exerted on the peripheric vascular system, which conclusion is fully borne out by the fact that if the splanchnics are divided no depression of the blood-pressure in the arteries is any longer observed. Hence this nerve may be called the depressor nerve. M. Claude-Bernard* remarks upon these facts that the heart is able, with the aid of the

* From whose report, in the 'Cours Scientifiques,' 1868, p. 421, the above condensed summary is taken.

sensory nerves supplying it, to regulate its size according to circumstances, by exerting a reflex action on the general circulation; and we can understand the mode in which the balance is maintained between the central and the peripheric circulation. If the sensibility of the walls of the heart be excited by too large a supply of blood, an energetic reflex action occurs, which dilates the capillaries and attracts the blood to the periphery. If, on the contrary, the internal sensibility of the heart is too feebly excited, the peripheric vessels contract and the blood regurgitates to the circulatory centre.

Aubert and Roever* have very recently made a series of experiments in reference to Ludwig and Cyon's depressor nerve, and upon the influence of the superior laryngeal nerve on the frequency of the pulse, and on blood-pressure in rabbits, cats, dogs, and lambs, previously placed under the influence of woorara. They found that in rabbits the effects of irritation of the centric extremity of the divided vagus usually diminished the pressure of the blood in the vessels, though it sometimes exalted it. In cats the same experiment produced a diminution of pressure amounting to as much as 50 per cent. In dogs, in which animals the vagus and sympathetic usually run together, stimulation of the artificially separated vagus caused a diminution of pressure to the extent of 30 per cent. When the conjoined nerves were irritated there was, on the other hand, a constant exaltation of pressure. These results, so far as regards the blood-pressure, were equally observable whether the nerves of both sides were cut through or whether only one vagus or vago-sympathetic trunk was divided. The effects, as regards the frequency of the pulse, however, differed under these two circumstances. If one cut vagus or vago-sympathetic were stimulated retardation of the pulse always occurred, but if both were divided no retardation occurred. Whence they conclude that the retarding influence caused by excitation of the vagus on one side is transmitted to the medulla oblongata, and thence down through the corresponding nerve of the opposite side. Excitation of the sympathetic trunk alone in all these animals always caused exaltation of blood-pressure, but no alteration in the frequency of the cardiac beats. Excitation of the upper extremity of the superior laryngeal nerve in dogs, cats, and lambs, usually caused an increase in the blood-pressure, without remarkable change in the frequency of the pulse; but in exhausted animals of these genera and in rabbits no effects were noticed.

MM. Kowalewsky and Adamük,† after careful investigation of the neck in cats, have only been able to discover an isolated depressor nerve in five cases out of more than fifty. When present, however, its excitation caused diminution of the pressure of the blood in the arterial system and retardation of the cardiac beats. In order that the latter effect should be produced it was necessary that one vagus should be intact. Excitation of the peripheric extremity of the divided nerve was inoperative. The vagus in these animals constantly possesses depressor fibres, even when an isolated depressor exists. These are also contained in the trunk of the vagus fibres, the excitation of which occasions, not diminution, but exaltation, of arterial pressure.

* 'Centralblatt,' 1868, p. 545. † Ibid.

Donders* has also been engaged in investigating the action of the vagus on the heart. He finds that tetanization of the peripheric end of one vagus prolongs the period of the cardiac revolutions, and especially of the diastole. With weak currents the effects increase regularly with the duration of their application. With currents of moderate strength the effects rise gradually to a maximum, at which for a certain length of time they remain. After section of both vagi, by which the indirect influence of the respiratory movements is removed, the inhibitory influence is still perceptible. The period of latent influence of the pneumogastrics on the heart is about one third of a second.

Sustschinsky,† from a series of investigations on the physiology of the peripheric extremities of the vagus in the heart, arrives at the following conclusions:—(1) That their excitability is not changed by removal of the sympathetic nerves alone. (2) It is exalted by the removal of all excito-motor nerves, whose influence is generally admitted. (3) It is increased to its maximum by increase of the intra-cardial pressure, although this is not apparent, because the excitability of the antagonists is also increased to the maximum. (4) On diminution of the intra-cardial pressure the excitability is at first increased, but soon diminishes. (5) On diminution of the supply of arterial blood to the walls of the heart it is increased. (6) On producing venous congestion it at first increases slowly and then quickly. (7) The inhibitory mechanism of the vagus has a certain independency. (8) The vagus is not only an inhibitory nerve, but also a regulator of the heart's action.

Goltz‡ notices that if a frog be struck repeatedly on the belly the heart stops, but if coincidently with the blows the skin of the extremities be sharply pinched, or be otherwise irritated, no stoppage occurs, though when the pain has ceased stoppage again occurs on beating the belly of the animal. He suggests, as an explanation, that violent irritation of the sensory nerves induces a condition analogous to paralysis of the medulla, rendering it incapable of transmitting more feeble reflectorial impulses. In another paper§ he shows that frogs from which the cerebrum has been removed still possess a certain degree of intelligence, as shown by their avoiding obstacles when stimulated to leap by pricking the skin of the legs, and by the retention of a certain power of preserving their equipoise when the board on which they are placed is slowly tilted. Essentially, however, such mutilated animals are reduced to the condition of reflex machines, being incapable of procuring their own food, and never spontaneously moving.

Prévost‖ has made careful inquiry into the structure and functions of the spheno-palatine ganglion in cats and rodents. He finds that it receives afferent and gives off efferent branches; the greater part of the former merely traverse the ganglion, but some are connected with nerve-cells; but many fibres contained in the efferent nerves originate from ganglionic cells in the ganglion. These last have not been demonstrated to exist in man. In the dog the afferent branches chiefly enter from the

* 'Pflüger's Archiv für Physiologie,' i, 1868, p. 331.
† 'Untersuch. aus dem Physiolog. Laborat. in Würzburg,' Leipzig, 1868.
‡ 'Centralblatt,' 1868, p. 593, and p. 690. § Ibid., p. 690.
‖ 'Brown-Séquard's Archives de Physiologie,' i, 1868, p. 7.

vidian and a branch of the superior maxillary, whilst a few come from the naso-palatine nerve. The ganglionic nerves emerging from the ganglion are divisible into three groups, of which the first is distributed to the mucous membrane of the nose, the second to the internal maxillary artery and its branches, whilst the third pass to the fibro-muscular tissue of the orbit, though there is no evidence that they influence the movements of this tissue. The nervus petrosus superficialis major contains no filaments arising from the ganglion. The vidian nerve supplies the velum palati, the spheno-palatine ganglion and nasal fossæ, but does not send branches into the anterior palatine nerve. M. Prévost agrees with Bernard in reference to the function of the gland, and finds that no sensory nerves proceed from it, and that its ablation causes no change in the nutrition of the nasal mucous membrane nor in the sense of smell. Electrical excitation of the ganglion causes elevation of temperature in, and abundant discharge of serosity from, the nostril of the same side. M. Prévost and M. Jolyet have demonstrated the important part played by the fibro-muscular tissue of the orbit in dogs in the production of exophthalmos when the superior extremity of the great sympathetic trunk is irritated, but he has not been able to convince himself that it is due to the sympathetic fibres.

Turner * gives the particulars of a careful dissection, showing that the buccinator nerve is a sensory nerve, since in one case it ran a separate course and arose from the superior maxillary division of the fifth.

Fräntzel † corroborates the statements of Beale and Arnold as regards the presence of spiral fibres entering the ganglionic nerve-cells of the sympathetic nerve, but he has not been able to assure himself that the spiral fibres are nervous in their nature, since he could not trace them into double-contoured fibres. The network of fine fibres described by Arnold as extended over the surface of the ganglion-cells he considers to be due to the presence of epithelial cells, with large nuclei lining the connective-tissue-capsule in which the ganglion-cells lie. In another paper ‡ he observes that there are certain points of difference between the sympathetic ganglion-cells and those situated in the ganglia on the posterior roots of the spinal nerves. The latter are unipolar and pear-shaped, and give origin to a double-contoured nerve; the former have at least two processes, which are very fine, and out of the nucleolus delicate rigid threads extend into the cell substance.

E. Bischoff § was unable to trace any connection between the nervus petrosus superficialis minor and the geniculate swellings of the portio dura in 36 carefully made dissections, though the two nerves lie in very close proximity to one another. He describes a minute gangliform enlargement on the bight of the loop formed by the former nerve.

M. Salkowski,‖ after performing numerous experiments upon rabbits, states, as the results of his inquiries, that the vaso-motor nerves of the ear, and the nerves that are subservient to the dilatation of the pupil, take origin in rabbits above the level of the atlas, and therefore, in all proba-

* Humphry and Turner's 'Journal of Anatomy,' 1867, i, p. 84.
† 'Virchow's Archiv,' 1867, xxxviii, p. 549.
‡ 'Schultze's Archiv f. Mikroscop. Anat.,' iv, p. 125.
§ 'Zeits. f. rat. Med.,' xxix, p. 161. ‖ Ibid., p. 167.

bility, from the medulla oblongata; course backwards without decussating in the spinal cord, and emerge generally through the anterior roots of the seventh and eighth cervical and first and second dorsal nerves, in order to enter the cervical sympathetic. He has been unable to determine whether a part of the fibres issuing from the medulla oblongata reach the sympathetic by communicating with the hypoglossal, as stated by Budge to occur in rabbits and frogs.

The researches of Mr. J. Lockhart Clarke* on the intimate structure of the brain constitute a worthy addition to his previous labours on this difficult branch of microscopical anatomy. He here gives, with very full and exact details, the precise position and relation of the several pairs of nuclei situated in the spinal cord. He shows how some of the fibres of the spinal accessory nerve arise from a nucleus common to it and to the pneumogastric, whilst others have their origin in the lateral grey substance and anterior cornu of the spinal cord. How the hypoglossal has a similar kind of double origin, the upper roots arising from a special ganglion, whilst the lower arise from the upper remains of the anterior cornu. How the nuclei of these two nerves are connected by fine communicating fibres, and how some of the fibres of the spinal accessory actually arise from the hypoglossal nucleus. How the portio dura not only forms a horizontal loop in the medulla with the sixth nerve, but forms a separate bundle of fibres, which descends vertically in the substance, and almost constitutes the whole mass of the fasciculus teres, and then courses forwards to arise from the lower part of the ganglionic mass, which alone is common to the portio dura and sixth. How the sensory division of the fifth is intimately connected with the vagus and the glosso-pharyngeal nerves in the grey tubercle. How the olivary bodies are co-ordinating centres for the greater number of the cranial nerves—centres of the reflex movements induced by sudden impressions made on the organs of special sense—are connected with speech, and are probably the seat of lesion in certain forms of paralysis; with many other points, interesting alike to the anatomist, the physiologist, and the pathologist, but which there is no space here to dwell upon.

Engelken† believes he has proved, in opposition to Schiff, v. Deen, and others, that both the anterior and posterior columns of the spinal cord are as excitable to properly applied stimuli as any other nerve-fibre. Sanders-Ezn,‡ on the contrary, maintains that the posterior columns of the spinal cord are insensible to mechanical irritation, and any apparent sensibility when they are stimulated is due to irritation of the posterior roots.

MUSCLE.

Whilst some are of opinion that the force by which ciliary movement is effected is of a nature essentially different from that characteristic of muscular tissue, Alexander Stuart§ considers that the general tendency of recent observations has been to place both kinds of movement in one category. During a late sojourn in Naples the opportu-

* 'Phil. Transact.,' 1868, p. 263. † 'Virchow's Archiv,' 1867, p. 198.
‡ 'Nederland Archiv,' ii, Heft iii, p. 379.
§ 'Henle und Pfeuffer's Zeitschrift,' xxix, 1867, p. 288.

nity occurred to him of observing well-marked ciliary movements in the cells of the larvæ of certain gasteropodous animals belonging to the genus Eolis, in which the cells were large, cylindrical, or somewhat flattened, with indications of transverse striation, and contained one, two, or more strongly refractile bodies. The number of cilia on these cells varied from six to eight, and their length was 0·014 mm. Besides the transverse striation the protoplasmic material contained within the cells presented, with careful adaptation of the light, longitudinal striæ or a columnar arrangement, each cell possessing from forty to sixty columns. That these elements are of a muscular nature M. Stuart considers is rendered evident by observing the movements of the nucleus, which may be seen to be drawn hither and thither, according to the action of the different strands, to the extent of one fourth of the whole length of the cell, ceasing when the cilia themselves cease to move, and recommencing with their recurrence. The striæ, like muscular tissue in general, became much more distinctly defined on immersion in a solution of 1 per cent. of chromic acid. M. Stuart agrees with Dr. Kistiakowsky, that both constant and interrupted electrical currents act as irritants to ciliary movement, and attributes the opposite results obtained by earlier experimenters to the employment of improperly constructed apparatus, occasioning the destruction of the cells. It is probable that in chemical composition the contents of the cells essentially consist of an albuminate of soda, since the movements are stopped in two or three minutes by weak acids, and if the action be not too long continued can be restored by alkalies, which powerfully stimulate ciliary action.

Engelmann* estimates the number of vibrations of the cilia of ciliated epithelium at as many as 700 per minute during life. Kühne† observes that the presence of free oxygen is requisite for the persistence of ciliary movement, but it will continue in a solution of oxidized hæmoglobin till all the hæmoglobin is reduced. Addition of acids, and even of CO_2, stops it, but it recurs on neutralization. Stuart states that the movement is stopped by sugar as soon as this has endosmosed into the interior of the cell.

Rouget,‡ from observations on the muscular spiral band in the stalk of the Vorticella, concludes that in the natural condition muscle is contracted, and that its elongation is a vital condition. He describes it as consisting of spiral fibres.§ and as having, like a spiral spring, a constant tendency to contract, into which condition it passes when all exciting and trophic agencies have ceased. He denies that in tetanus there is an oscillatory movement of the muscular elements.

A remarkable form of muscular fibre existing in the crocodile has been described by Dr. Hair.‖ In this case the fibres consist of a

* 'Centralblatt,' 1867, No. 42. † 'Schultze's Archiv,' 1867, ii, p. 372.

‡ 'Comptes Rend.,' lxiv, p. 1128, p. 1232, p. 1276.

§ A full account of the essay of M. Rouget, contained in Brown-Séquard's 'Journal de l'Anatomie,' which should have been noticed in the last report, will be found in the 'Brit. and For. Med.-Chir. Rev.,' 1867.

‖ Humphry and Turner's 'Journal of Anatomy,' 1867, ii, p. 28.

series of hollow cones with crescentic bases, which are let into one another, and in neighbouring bundles are arranged with the bases of the cones alternately looking forwards and backwards.

Frankenhauser * describes the nerves of unstriped muscle as extraordinarily fine and delicate in their ultimate branchings, the point of division presenting minute knots, resembling, on a small scale, the nuclei of the larger fibres; they do not terminate in loops, but enter the nuclei of the muscular fibre, and end by either a simple or by a branched extremity, according to whether the nuclei have one or two nuclear corpuscles.

Lindgren† coincides with Frankenhauser in examinations he has made of the mode of termination of the nerves of the uterus. They either end in nuclear-like bodies, abruptly or gradually, or in finely pointed extremities in the substance of the muscle.

Winkler‡ describes the muscular bundles of the heart as being provided with a very delicate sarcolemma.

O. Weber,§ in an essay on the regeneration of muscular tissue after injury, seeks to show that the new fibres proceed from the nuclei found in the old, each cell producing one fibre.

Hofmann|| also found that new muscular fibres originated in the muscle-corpuscles of the old, but he maintains that several unite to form one fibre.

Fick and Dybkowsky ¶ have shown that muscles, in assuming the contracted condition of rigor mortis, just as in ordinary contraction, develop heat, and to this source they attribute the high temperature sometimes observed in bodies after yellow fever, cholera, and other affections, the muscles then becoming rapidly stiff.

Helmholtz adds to Wollaston's and Haughton's observations on the sound of muscle in contraction, that the note is more acute in proportion to the rapidity with which the shocks of an electric battery are applied to it; in other words, in correspondence with the rapidity of the successive contractions of the tissue.

Place** estimates the period of latent excitation in the muscles of frogs at 0·005 of a sec. If the muscle be first extended the work done rises until about the third part of the maximum tension is attained, when it again sinks. He finds the rapidity of propagation of the excitation through muscle at about 1 mètre per second.

The Rev. S. Haughton†† estimates that the force of a muscle is proportional to the area of its cross section, and that the force of a muscle is also proportionate to the cross section of the tendon that conveys its influence to a distant point. From experiment he found that the force of contraction of the muscles per square inch is, in the arm, 94·7 lb. and in the leg 110·4 lb. By Donders that of the arm is given at 122 lb. per square inch. As a mean of both experiments 109·4 lb. may be taken. This agrees fairly with the observations of Knorz.

* 'Henle und Meissner's Bericht,' p. 49, 1867. † Ibid., p. 50.
‡ 'Reichert's Archiv,' 1867, p. 221.
§ 'Virchow's Archiv,' xxxix, Heft ii. || Ibid., xl, Heft iii and iv.
¶ 'Vierteljahrs. der Naturf. Gesell. in Zurich,' 1867.
** 'Nederland Archiv,' iii, 1867, Heft ii. †† 'Proc. Roy. Soc.,' 1867, No. 94.

Baxter* finds that in March and April 1 grain of frog's muscle can raise 445 grains 1-53rd of an inch high, whilst in June and July 1 grain can raise 608 grains through the same height. This is in accordance with the statement of Schmulewitsch,† that, within certain limits, the higher the temperature of muscle the more work is it able to perform with equal weighting and stimulus.

Fick‡ finds the power possessed by 1 grain of frog's muscle is 5000 millimètre-grammes for one single contraction.

Rosenthal§ estimates the absolute muscle-force for the muscles of the frog at from 2·3 to 3 kilogrammes for each square centimètre in section. Koster‖ estimates it at 10 kilogrammes for each square centimètre for the muscles of the leg, and 7·4 for those of the arm.

An interesting series of lectures, the last he delivered, by M. Matteucci, on electro-physiology, are contained in the 'Revue des Cours Scientifiques' for 1868. In regard to the point at present under discussion, he found that the gastrocnemius of a frog weighing about 0·320 grains, with a weight of 100 grammes, raised it in contraction to a weight of 0·84 mm., with a weight of 70 grammes to 1·270 mm., and with 10 grammes to 1·412 mm. From these numbers he calculated that the mechanical work of a single contraction is expressed by 0·00001457 kilogramme.

M. Marey¶ has shown that the rapidity with which muscles respond to direct irritation varies much in different animals, being extremely slow in the tortoise, quicker in the frog, and very rapid in birds; but they all respond alike to electrical, mechanical, or other excitation of their *nerves*, and the movement thus produced he calls a shake or shock (*secousse*). An ordinary contraction consists of a series of shocks, which succeed one another at very short intervals. He compares it to sound, and just as a single vibration of a tuning fork cannot be called a note, but to produce this there must be a succession of vibrations, so a single impulse cannot be called a true muscular contraction. If a muscle be excited by a succession of electrical excitations, more and more closely approximated in point of time, it may be shown that the contractions gradually fuse one into another, so that the separate shocks are replaced by a state of immobility of the shortened muscle, the muscle not having time to relax before another shock commences. Considerable differences, nevertheless, exist amongst different animals. Thus, if a bird's muscle is irritated by 75 electrical sparks in a second, it still displays, when made to register its movements on a revolving cylinder or disc, a series of vibrations; whilst the muscles of a tortoise are thrown into a state of almost uniform contraction with only 3 electrical shocks per second. Similar phenomena can be produced by mechanical irritation of the nerves. When the muscles of a frog are acted on by strychnia, it may readily be shown that the apparently rigid condition of its muscles is due to a series of impulses in which the muscle has not time to relax before another one commences. Taking advantage of the fact that

* 'Archives of Medicine,' iv, pp. 298 and 326.
† 'Centralblatt,' 1867, and 'Med. Jahrbucher Deutsche,' i.
‡ 'Virchow's Jahrsbericht' for 1867, p. 80.
§ 'Comptes Rendus,' lxiv, p. 1143.
‖ 'Archiv Neerlandaises,' ii, No. 2.
¶ 'P. R. C. Sc.,' iv, 1867, p. 214.

muscles become thicker in proportion as they shorten, he has experimented on the human subject by placing the arm between two plates (constituting his *pince myographique*), the degree of separation or approximation of which is registered on a revolving disc by means of some ingenious mechanism. Similar results to those above mentioned are obtained.

Some important investigations have been undertaken by Dr. Ludimar Hermann,* with the view of explaining the phenomena of electrotonus and of the electrical currents naturally existing in muscle and nerve on a chemical theory. The chief results arrived at by Dr. Hermann are briefly the following:—(1) Frogs' muscles, deprived of blood, removed from the body, and disturbed as little as possible, contain no oxygen capable of being removed by the air-pump, but a small quantity of N is certainly present, apparently taken up by Dalton's law of absorption, and also small quantities of free and combined CO_2, the latter, in all probability, not belonging to the muscle itself. By the gradual or sudden supervention of rigor mortis, or of tetanus, a considerable quantity of free carbonic acid is developed in the muscle, but the proportion in the latter case is always less than that in the former. If rigor mortis succeed tetanus the quantity of CO_2 produced in the rigor mortis is less in proportion to the quantity developed during the period that the muscle was in the tetanic state. In putrefaction a different production of gases occurs, especially resulting in the formation of carbonic acid and nitrogen in determinate but variable proportion. He finds that the absorption of oxygen by the muscles of frogs deprived of blood depends upon a process of decomposition that commences immediately after removal from the body, and especially occurs at the free surface of the section. It increases as decomposition advances. No consumption of oxygen can be demonstrated to take place in the muscles during life; if there be any, the quantity must be extremely small. The absorption of oxygen is increased by movement of the muscle, which brings it into contact with fresh portions of air, but no increase of absorption can be shown to occur as the result of contraction; if it be present, it is very small. (3) The extrication of carbonic acid from the muscle detached from the body depends in part on disintegrating processes taking place at the surface, but in part also upon the excretion of physiologically formed CO_2; the latter portion is demonstrable as soon as its increased formation occurs in the muscle, as the result of rigor mortis or contraction.

Exposure to an atmosphere of oxygen may postpone the death of detached muscles, perhaps through a small, though not proven, absorption of oxygen, or through a more complete elimination of CO_2. This effect of O is not observable if the muscles are kept permanently contracted. Coetaneously there exists a death-hastening power of the O, by its action on the superficial layers, which in thin muscles may even preponderate. H, N, NO, and CO are indifferent gases towards muscle. CO_2 acts upon it like other acids, only more slowly. The operation of NO_2 gas is not ascertained.

* 'Untersuchungen über den Stoff-wechsel der Muskeln,' &c., Berlin, 1867, and 'Weitere Untersuch. zu Physiol. der Muskeln und Nerven,' 1867.

Other researches of Lud. Hermann indicate that in the act of muscular contraction, as well as in the peculiar condition of post-mortem rigidity, chemical changes identical in their nature take place, resulting in the disintegration or splitting up of some complex substance, previously present in the muscle, into a fixed acid (usually the lactic), carbonic acid, and myosin, the latter constituting a gelatinous excretion or deposit. Identical changes, only far slower and more gradual, occur throughout life, even when the muscle is in the state of so-called rest, but they are immediately accelerated by the application of any stimulus to the muscle; and if the disintegration be continuous, without coetaneous and corresponding nutritive processes tending to the oxidation and restitution of the muscular substance, tetanus or rigor mortis must occur. In the act of making a transverse section of a muscle a violent mechanical stimulus is applied, which causes its most superficial or external layer to be destroyed and to pass into the stiffness of tetanus. By the same act we also accelerate in a high degree the ordinarily slow changes taking place during life in a number of layers lying successively more and more distant from the surface of section; but it is highly probable that the disintegrating processes, after attaining a certain degree of intensity in any single layer, progresses afterwards more and more slowly till complete tetanus or stiffening occurs. Hence the layer undergoing most active change, after the lapse of a short time, will not be the most external one, but some layer situated at a greater or less distance from the surface of the section.

On theoretical grounds M. Hermann thinks it probable that those parts of the muscle which are undergoing active disintegration behave themselves negatively to those which are undergoing the same changes more slowly, and he gives various proofs that by accelerating the disintegrating processes any chosen part of a muscle may be made strongly electro-negative to the rest. The acceleration can be easily accomplished by raising the temperature of the given part to 100° F., whilst the remaining parts are kept at the ordinary temperature of the air; the part so warmed is invariably powerfully electro-negative to the rest of the muscle. M. Hermann has shown that an electric current can be made evident in a fermenting fluid, passing from the substance undergoing fermentation towards the ferment. This he demonstrates by constructing one of the poles of a galvanometer of a piece of cheese, and immersing it in a solution of milk-sugar, in which the other pole, made of an indifferent substance, is also plunged. In this instance, it will be observed, there is a decomposition of a complex substance (milk sugar) under the operation of a ferment (cheese), one of the results being an acid (lactic acid), conditions which are essentially analogous to those occurring in that splitting-up of muscular and nervous tissue which is constantly taking place both in life and after death. In accordance with this it may be shown that of two layers of muscular substance in juxtaposition to one another, that one which is undergoing disintegration more rapidly than the other, and which therefore acts upon the latter as a ferment, will be electro-negative to the more slowly decomposing layer, and more energetically so in proportion to

the activity of the changes taking place in it. Hence it follows that the surface of the transverse section of a muscle which, owing to the mechanical irritation to which it has been subjected, and to the action of the oxygen of the air, is undergoing disintegration with the maximum of rapidity, will necessarily be negative to every other part of the muscle, but especially to the natural longitudinal section, which is well protected by its investments of perimysium and sarcolemma; and, in like manner, every part of the natural longitudinal section must, in proportion as it approximates the transverse section, be negative to that more distant from the transverse section.

On the theory of Hermann, the phenomena of electrotonus are explained much more simply than on that proposed by Dubois-Reymond, and now very generally received. According to this theory, the polarizing current accelerates the splitting up or disintegration of the nervous substance beyond the electrodes in the catelectrotonized section, whilst it retards it in the anelectrotonized section. These influences diminish in proportion to the distance from the electrodes.

Following up these investigations, and applying them to the nature and essential characters of nervous action, M. Hermann believes it may be proved—(1) That the excitability of any portion of a nerve depends on the rapidity of the disintegrating processes which are taking place in it. (2) That the excitation of any portion of nerve depends upon a sudden acceleration of the disintegrating processes in it. From whence it follows (3) that the conduction of the excitation in a nerve depends upon the propagation of a sudden acceleration of the disintegrating processes along the nerve. The first of the above-named propositions explains the hitherto paradoxical observation that the death of the nerves (and muscles) exalts their excitability, and that this augmentation in the nerves takes place earlier near the cerebrum, and near a transverse section, than lower down near the muscle (Ritter, Valli, Rosenthal's law), for the disintegrating process starts from a transverse section, and slowly progresses through the nerves; and further, the nearer the centrum, as a general rule, the more excitable is the nerve in the case of motor nerves.

As regards sensory nerves a slight difference exists; in them all electrical currents, in whatever manner directed, act as irritants. And Hermann considers that sensory nerves are always excited if the rapidity of the disintegrating processes are different from their usual condition, whether increased or diminished; the customary condition may be called static, the increased activity a hyperstatic, and the diminished a hypostatic condition. Shortly expressed, the functions of a nerve may be said to be that it contains an unstable substance, whose disintegration can be transiently suddenly exalted through modifying influences acting rapidly on its substance (nerve stimuli). A persistent acceleration is effected by the operation of catelectrotonus and by a transverse section, both influences being strongest in the proximity of the point of origin of the nerve. A persistent diminution or retardation is effected by anelectrotonus, and most strongly at the anode. Sudden acceleration propagates itself with great rapidity through the whole length of the nerve. This is occasioned by the operation of a product of disinte-

gration (? lactic acid), formed at any given part, acting upon the part in its immediate neighbourhood. This effect is so much the greater the more of the product of disintegration the accelerated spot contains at the moment of excitation; it is thus greater in those spots in which disintegration occurs more rapidly when the nerve is at rest, and may be diminished if the rapidity of disintegration during rest is much retarded (as in the case of strongly anelectrotonized parts).

KIDNEYS.—URINE.

No important researches have been undertaken in reference to the structure of the kidneys since the date of the last report, but several interesting series of experiments have been made upon the urine. Amongst these the investigations of Dr. Parkes * on the elimination of nitrogen by the kidneys during rest and exercise, first on a diet without nitrogen, and afterwards on a regulated diet of nitrogen, stand pre-eminent. The experiments were made on soldiers doing duty at Netley. Two were employed on each occasion. In both instances the experiment was conducted in a similar manner. In the first experiment the men were first kept under observation for 6 days, to determine the mean daily amount of food, excreta, &c. They were then placed for 2 days on a non-nitrogenous diet of arrowroot, sugar, and butter, and were kept at perfect rest. They then resumed for 4 days their former regulated diet and usual occupations, and at the expiration of that period were again placed on the non-nitrogenous diet, but were made to take severe exercise for 2 days, on the first day walking 23·76 miles, and on the second 32·78 miles. The work done by one man was = 140,839 kilogramme-mètres, or 453·6 tons lifted one foot; and by the other man the work done was 107,655 kilogramme-mètres, or 346·74 tons lifted a foot. Lastly, the men were again placed on their regulated diet, and took their ordinary exercise for 4 days. As a general result of these experiments, it appeared that the conclusion of MM. Fick and Wislicenus, mentioned in the last report, is fairly corroborated, that on a non-nitrogenous diet exercise produces no notable increase in the urea of the urine, although when the whole period during and after the exercise is considered there is a slight increase. But although it may be considered to be proved that severe work may be performed on non-nitrogenous diet for a short time, it by no means follows that nitrogen is unnecessary. For a short period the well-fed body possesses sufficient nitrogen to permit muscular exertion to go on for some time without fresh supply. But if work is to be done, there can be no doubt that nitrogen must be supplied, and supplied in proportion to the amount of work.

The second series of experiments so far differed from the first that the men were kept on the same diet for 16 days. For 4 days they were at their ordinary employment; during 2 days rested; returned to ordinary work for 4 days; took very active exercise for 2 days, and were then for 4 days more on ordinary occupation. Their food consisted of 16 oz. of bread, containing 61 grs. of nitrogen; 15 oz. raw, equal to

* 'Proceed. of the Roy. Soc.,' 1867.

9 oz. cooked, meat, with 213 grs. of nitrogen; 12 oz. of potatoes, with 12 grs. of nitrogen; 3 oz. of cabbage, with ·1 of nitrogen; 6 oz. of milk, with 16·5 grs. of nitrogen; 3 oz. of sugar, 1 oz. of butter, ·25 of salt, 20 oz. of tea, 20 oz. of coffee, and 3 to 9 oz. of water. Taking the results obtained in both series of experiments into consideration, it appeared that with an unchanged ingress of nitrogen into the system there was a slight excess of nitrogenous excretion during rest, as compared with a period of ordinary exercise. There was also a decrease of urinary nitrogenous excretion during active exercise, as compared with a period of rest; and this was perceptible both when the ingress of nitrogen was stopped as well as when nitrogen was supplied in regular amount. There was an excess, not great, but long continued, in nitrogenous excretion after exercise. There was a retention of nitrogen in the system when it was again supplied, after having been cut off, after both rest and exercise, and greatest in the latter case, showing that it is needed in the system, and that an insufficient supply at one time must be subsequently compensated. The explanation of the above facts, which Prof. Parkes propounds, is that during action a muscle appropriates more nitrogen than it gives off, and during rest gives off more than it appropriates; or, more fully, when a voluntary muscle is brought into action by the influence of the will it appropriates nitrogen and grows; the stimulus, or the act of union, gives rise to changes in the non-nitrogenous substances surrounding the ultimate elements of the muscular substance, which cause the conversion of heat into motion. The contraction continues (the will still acting) until the effete products of these changes arrest it; a state next ensues during which time the effete products are removed, the muscle loses nitrogen, and can again be called into action by a stimulus. If, in addition to these observations, the calculations of Prof. Haughton be considered, by which it is shown that the combustion of such an amount of protein as would produce 500 grs. of urea is insufficient to account for the internal and external mechanical work done by the body, there is substantial ground for maintaining that, although the exercise of the muscles is accompanied by a certain disintegration or oxidation of their tissue, which accounts for a portion of the urea eliminated, the rest proceeding from the direct oxidation in the blood of the albuminous constituents of that fluid, yet that the main source of muscular energy is to be looked for in the oxidation of hydro-carbonaceous compounds, the heat developed by which the muscles can convert into mechanical force.

Weigelin * has, nevertheless, lately put forth the statement that, although there is not any material increase in the amount of urea eliminated during labour, there is a marked increase, amounting to as much as 50 per cent., in the period immediately succeeding to labour. He finds, also, that persistent or unproductive muscular exertion produces more urea than in that which effects work. The chief regulator of the quantity of urea is the nature of the food. Prof. Haughton estimates 2 grs. per lb. of body weight as the vital constant, or that portion which is produced by the internal work of the body required to

* 'Reichert's Archiv,' 1868, p. 207.

carry on the acts of circulation, respiration, &c. Ranke, who has made an extensive series of experiments, found that in fasting, or on non-nitrogenous diet, the quantity of urea sank to 264 grs. per diem, whilst with full meat diet it amounted to 1332 grs., the maximum being to the minimum as 1 to 5. Nearly all the urea of the food is thus eliminated; on change of diet, however, variations occur, and it is not till after the lapse of a few days that the quantity again becomes constant.

Seegen* endeavours to show that, whilst a large proportion of the nitrogen of the food which is not applied to the nutrition of the tissues is eliminated by the urine and fæces, there is a certain, and not inconsiderable, amount which must leave the body in the gaseous state. The addition of a small quantity of soda, or of carbonate of soda, to the food, greatly increases the quantity of urea, and therefore of nitrogen, eliminated.

URINE.

In some experiments by Verson and Klein † the influence of common salt on the animal body was investigated. They found that an almost entire absence of salt, consuming only about 20 grains instead of 386, the usual amount, caused a diminution in the amount of urea excreted, but increased that of the uric acid. Both at the beginning of the experiment and also on returning to the use of salt there was a diminished excretion of urine, notwithstanding that, in the latter case, more water was ingested on account of thirst.

G. Meissner‡ has investigated the origin of the uric acid in the urine of birds. He quotes Zalesky's § observation that, in 97 grammes of the blood of the goose, and in 43 grammes of that of the fowl, he was unable to discover any uric acid, which, with other circumstances, led him to support the view, already propounded in 1848 by Strahl and Lieberkühn, that urea was formed at the kidneys. Meissner, however, operating on larger quantities (300—550 grammes, drawn from several fowls), obtained amounts of uric acid equivalent to about 0·031 per 1000 of blood, which, though small, he yet considers sufficient to explain the amount excreted per diem by a fowl, if a calculation be made of the amount of blood which traverses the kidneys in that space of time.

Besides the blood, Meissner examined other organs of the bird, and found notable quantities of urea in the liver. In one experiment he obtained 0·31 gramme from 500 grammes of liver; in another, 0·14 gramme in 298 grammes. Cloetta, however, as well as Stokvis and Scherer, had already shown the presence of uric acid in the liver. Other organs of the bird, as the muscles and lungs, contained no uric acid, or only traces of it; and hence he draws the conclusion that the liver is the chief seat of the formation of uric acid in the animal body.

In further experiments,‖ made to determine the place of origin of the

* 'Sitzungsber. d. Wien. Akad.,' lv, ii, p. 357. † Ibid., p. 627.
‡ 'Cbl.,' 1868, p. 226. § Ibid., 1865, p. 202. ‖ Ibid., 1868, p. 275.

urea in mammals, Meissner, in conjunction with Bullard, came to the conclusion that this also was chiefly formed at the liver. For he found 0·09 gramme of urea in 474 grammes of the liver of the dog, and 0·025 gramme in 347 grammes of the liver of the rabbit. But since no other tissue of the body, and especially not the muscles, contains urea, Meissner attributes its formation to processes occurring in that organ. Hence its absence, or great diminution, in the tissues, as noticed by Frerichs and Städeler in acute, and by Harley in chronic, atrophy of the liver. He conceives that it proceeds from the disintegration of hæmoglobin of effete red corpuscles into urea, glycogen, and biliary colouring matter.

As regards the excretion of kreatin, kreatinin, and other nitrogenized constituents of the urine, by mammals, he finds both the former constantly in the urine of the dog. On the introduction of kreatin under the skin or in the intestine, it is speedily eliminated (in thirteen hours), chiefly as kreatin, but in small part as kreatinin. In opposition to Munk,* he finds no conversion of the kreatin into urea. Kreatinin introduced in the same way is also chiefly eliminated without change, a part being probably oxidized in the blood, which is in accordance with its easy oxidizability by ozone, as shown by von Gorup-Besanez. With abundant flesh food much, with farinaceous and food free from kreatin little, kreatin was eliminated; but a fasting animal continued to eliminate kreatin, since it consumed its own tissue.

In well-fed animals (dogs) allantoin was constantly found in the urine in small quantities, as well as uric acid; but both were absent, or present only in very small quantity, in animals fed on a diet containing no albumen. Uric acid seems to be eliminated soon after food, allantoin at a later period, which he thinks is due to the circumstance that at the former period uric acid is wholly converted into urea, but at a later period, when the nutritive processes are less actively performed, it forms urea and allantoin.

Meissner finishes his paper by noting the effects of work on the urine of a dog (the work consisted of five hours' running). The urine was acid, sparing in quantity (alkaline on bread diet). Uric acid fails, but allantoin continues, to be excreted. Kreatin and kreatinin are at first deficient, but subsequently are more abundantly eliminated, so that their discharge appears only to be delayed. Xanthin also appeared. The reason of these substances appearing he thinks due to the oxygen being taken up by nitrogenous free substances during exercise.

Many other abstracts have been excluded for want of space, but this report should not conclude without special reference to the valuable paper by Dr. A. Crum Brown and Dr. Thomas R. Fraser, "On the Connection between Chemical Constitution and Physiological Action," in the 'Transact. of the Roy. Soc. of Edinburgh" for 1868.

* 'Deutsche Klinik,' 1862, p. 299.

REPORT ON PRACTICAL MEDICINE.

BY

FRANCIS E. ANSTIE, M.D., F.R.C.P.

A. DISEASES OF THE GENERAL SYSTEM.

Tuberculosis.—Inoculability of Tubercle.

In the 'Biennial Retrospect' for 1865-6 we noticed the early experiments of M. Villemin on inoculation of tubercle. These experiments have been the starting-point of a number of important researches, both by their author ('Études sur la Tuberculose,' Paris, 1868) and by others.

M. Simon communicated to the Pathological Society some experiments made for the purpose of testing Villemin's results.

He inoculated ten rabbits with softening yellow tubercle from the lungs of a human patient. Five months later he killed nine of them.

Dissection showed tubercle in the lungs in five cases, and the tuberculous matter here found was inoculated upon three other rabbits which were killed five months later. In the latter animals there were extensive tuberculous consolidations of the lungs and enlargement of the mesenteric glands. In one there were similar lesions in the spleen and the liver. It was remarkable that, although the common physical properties of the product were those which in men we call tubercular, and, on the whole, resembling yellow tubercles, the small, rounded masses seen in the lungs, when magnified, showed a semi-transparent, grey circumference.

Prof. Lebert ('Virchow's Archiv,' xli, 1867) made forty-five experiments. In eleven experiments on guinea-pigs and rabbits he inoculated what he considered as typical tubercle taken from phthisical patients in various stages of the disease, and in one or two cases from masses of chronic *pneumonic* deposit, and in one case from the mesenteric glands of a child who had pneumonic deposits and tubercular granulations elsewhere.

All these experiments were successful, and produced substantially the same results in every case. In the second group of experiments two dogs had pus injected into the jugular vein. In one of these animals four injections were made within three weeks; the last was followed by diarrhœa and vomiting, and, lastly, by emaciation. The animal was killed thirty-four days after the first injection, and many disseminated abscesses were found in the lungs, and nodules from a pin's-head size to that of a lentil in the liver; in the other dog the

changes found were semi-transparent granulations, partly in the alveoli, partly between the pulmonary fibres; the apices of both lungs were adherent. The liver contained greyish-yellow nodules similar to those in the lungs. In the nine experiments of the next group bronchial and cavernous secretion was used, partly from patients with chronic pneumonia, partly from cases of pulmonary gangrene. No granulations were found. The animals seemed to die rapidly with blood-poisoning. One dog was next injected per rectum with phosphorous oil; a biliary fistula had been established fourteen days before. Many nodules, as large as pins' heads, each with a central dark blackish point, were found on the pulmonary pleura; they did not invade the lung-tissues. Numerous similar nodules, pale grey and firm, like those in the animals of the first group, were found in both lungs. The nodules possessed the same microscopic structure with those existing in animals inoculated with tubercle. In the last group of experiments melanotic, sarcomatous, cancroid, and cancerous products were inoculated. Of three dogs inoculated with melanotic matter one died in two and a half months, and a well-marked stellate cicatrix was found at the site of the wound, under which were a number of small nodules, consisting exclusively of small round cells, like those of lymphatic glands. Lebert regards them as identical with tubercle.

Two experiments with sarcomatous matter were without result, except that in one a typical bronchial alveolitis was found. In two other experiments cancroid and carcinomatous matter was injected. No cancer was produced, but in one something like tubercle in the lungs. In two experiments charcoal was injected into the jugular vein. Three cases were immediately fatal. In two others the charcoal penetrated to the pulmonary capillaries, liver, and in one case to the brain. One animal was killed two and a half months later, when apparently healthy. Two nodular masses of areolar infiltration were found, each with a little bit of charcoal in its centre. Several such fragments were found in the adventitia of the pulmonary arteries. In the other rabbit, which died twenty-four days after injection, there were wide-spread foci of irritation. The appearances resembled those of human pneumonia, and the alveoli were filled with a finely granular matter, with a few epithelial cells. In the last six experiments mercury was injected into the veins in five, and in one into the trachea. The appearances produced had no particular relation to tubercle.

Dr. Roustan ('Recherches sur l'inoculabilité de la Phthisie,' Paris, 1867) describes several series of experiments. In the first, 1 rabbit was inoculated with grey tubercle, 1 with caseous pneumonic matter, and the third with tissue of softened tubercular mesenteric gland. In the second series guinea-pigs were employed, and the general results were confirmatory of Villemin's conclusions. A dog was twice inoculated, first with yellow tubercle, secondly with grey; characteristic lesions were found in many internal organs. In two guigea-pigs the blood of a phthisical patient was injected under the skin without result. The author quotes the experiments of Dr. Goujon, showing the liability of guinea-pigs to spontaneous tubercle, and the rapidity with which tubercular inoculation produced effects.

Dr. Waldenburg ('Central Zeitung,' Dec. 1867) experimented on 80 rabbits and guinea-pigs. In the first series of experiments miliary tubercles were injected from a phthisical patient. Of 16 animals, 10 died within a few days, and no tubercle was found. In the other 6, characteristic changes were found in the liver or lungs, or both, besides pneumonia; in several cases cheesy infiltration; in others deposits were found in the mesentery, the intestines, the kidneys, and the spleen. In one animal, which had extensive deposits of tubercle, no changes were found at the site of the operation. In the second series cheesy matter was injected with negative results. In the third series cheesy lymphatic gland-tissue was used. Of 7 animals, 4 had miliary foci in the liver, and 1 in the large intestine. In the fourth series pus from the inoculation-wound of another animal was employed. Of 9 animals, 2 had miliary tubercle in the intestine, 1 had red hepatization of one lung, with partial cheesy infiltration of the lower lobe and suppurative pleurisy; in 4 there were tubercles in the liver. Besides these experiments, in many others inert matter of various kinds were introduced beneath the skin. In all these experiments the lymphatic glands were enlarged and infiltrated, and the internal organs had miliary tubercles.

On the other hand, Vogel ('Deutsches Archiv f. klin. Med.,' July, 1866) and Feltz ('Gaz. Méd. de Strasbourg,' Oct. 25, 1867) have made a number of experiments which were entirely unsuccessful.

In England most important researches have been made by Drs. Wilson Fox and Burdon-Sanderson, in extension of those by Mr. Simon and by the foreign observers. Dr. W. Fox inoculated with various materials 117 guinea-pigs and 12 rabbits. Of the guinea-pigs, 58 became tubercular, 6 gave doubtful results, and no effect was produced in 53. The animals were carefully preserved in healthy surroundings.

As regards the local effects, excluding certain limited and seemingly accidental ones, masses of dry cheesy matter are produced beneath the skin, which rather resemble the *débris* of fatty degeneration than true pus-cells. This matter is generally encysted, and sometimes there are two or several such masses, not always close together. Besides these, numerous small granulations are scattered beneath the skin over a considerable area. These are sometimes grey and sometimes yellow, and larger masses are sometimes found strikingly like tubercular lymphatic glands. Cords of induration also extend at variable depth and for variable distances, through the subcutaneous and muscular tissue; their central parts are often cheesy. Neither the cords nor the granulations are constant, but they are pretty frequent. Examined under the microscope, they seem mostly a mass of nuclei, or else of cells imbedded in a tissue which conceals all but the nuclei. At the circumference of the part these granulations appear like round- or spindle-shaped cells in a trabeculated tissue; the general resemblance is to the elementary structure of a lymphatic gland. Many of the cells, and also of the nuclei, show various degrees of fatty degeneration. In these masses, and in their neighbourhood, singular strings and rows of cells and nuclei are sometimes seen; their size is twice or three times that of a capillary. They suggested to Fox the idea of a lymphatic tube

swollen either by growth from within or by cells carried to it, especially the former. The lymphatic glands near the wound are usually much enlarged, and their apparent number is also increased; they are infiltrated with grey and with cheesy muatter, and the latter sometimes softens. Occasionally the glands all over the body seem similarly affected. In the lungs numerous granulations are found, generally scattered, but numerous in group; they have a semi-transparent cartilaginous margin and a cheesy centre. Lobar pneumonia and a general infiltration independent of granules are exceedingly rare. The points of origin of the lung deposits are either around the bronchi, around the blood-vessels, or in the tissue of the lungs. The liver is much increased in size and heavier, and is marked with numerous deposits of a semi-transparent character, which can be clearly distinguished from the deposits either of cirrhosis or of albuminoid liver. The spleen also enlarges much. Small whitish spots are often scattered thickly in it. Occasionally large portions of the spleen are converted into a semi-transparent tissue, seeming to be originally composed of fine granulation. Various forms of cheesy change are also found. In the alimentary canal the small intestines and the cæcum are mostly affected. The patches of Peyer are enlarged, milky white spots are seen in their substance, and sometimes spots of ulceration in the cæcum, besides enlargement of the patches. Ulceration, partial or total, is not uncommon, the ulcers usually cheesy and granular. The mesenteric glands are almost invariably affected, and dropsy in the peritoneum is very common. Fox attributes it (with Lebert) to obstructed circulation. Grey tubercle was found scattered in the kidney in two cases. In rabbits Fox injected pus five times without producing any general affection, but only extensive local' suppuration. Inoculation with tubercle on 7 rabbits only produced distinct results in 2, and in these cases there was some room for fallacy. In regard to the possibility of identifying the artifically produced deposits, Fox takes as the standard of tubercle that grey miliary substance, as to the nature of which there is least difference of opinion; and he maintains, by elaborate analysis, that the places of deposits and the form of the artificial tubercle exactly resemble that of the natural. He feels sure that the deposits cannot be confounded either with lobular pneumonia or with catarrhal pneumonia, or with any infiltration of the interior of the alveoli. On the whole, if these new growths be not tubercle, we have before us a new and hitherto unknown constitutional disease in the rodentia, consisting of growths which both in external and minute appearances essentially resemble tubercle as seen in man, which occur in the same organs and the same parts of them which tubercle affects; we have the same fatal characters and the same degenerative changes as tubercle, and we have no marked character by which they can be distinguished from the latter. The only known disease with which it has the least affinity is leucocythemia; but the growths in this case are softer, whiter, and more milky than those of the tubercle. Important questions, however, remain as to the identity of the disease in guinea-pigs and in man; and this question Fox considers for the present insoluble.

Fox does not agree with Villemin that tubercle is a specific disease,

producible by tubercle alone. Nor is the method of inoculation by injection to be held responsible, for he remarks that he has obtained results by the mere insertion of a fragment, after Dr. Sanderson's example; the effects were quite as intense and peculiar as those which were produced by the inoculation of tubercle. Neither does Fox believe that Lebert's experiments have proved the possibility of a purely mechanical origin of the deposits. It is especially impossible for Fox to believe that embolism has anything to do with the disastrous effects of the injection. He considers it certain that the effects of infection are more surely produced by the inoculation of tubercle than by that of indifferent substances. As regards the effects of septic absorption, Fox clearly separates these from any inflammatory affections around bronchi, alveoli, or arteries; he cannot admit that the theory of tubercle suggested by Cohnheim's researches on the exit corpuscles from the blood-vessels is supported by observation of the growths. In conclusion, he remarks that the growths produced appeared to come from abnormal nutritive activity of tissues, either certainly lymphatic in their nature, to the introduction of septic matter into the system, which irritates the lymphatic tissues as the cause of the increased growth; the action, however, once exerted, tends to reproduce itself in the body.

More important than any others are the recent researches of Dr. Burdon-Sanderson. In the 'Report of the Medical Officer to the Privy Council for 1867' it was shown by Dr. Sanderson that an infective disease can be produced in the rodent animals by the inoculation of tuberculous matter of human origin, which is anatomically identical with miliary tuberculosis, and that when so produced it can be communicated without fail from one living animal to another by the insertion of the smallest possible quantity of diseased tissue. It was further proved that the same disease may result either from the insertion under the skin of various non-tuberculous morbid products or from any external injury, provided that it is of sufficient intensity to produce local subcutaneous inflammation, and that in each case an interval of several weeks after the primary injury must elapse before the development of the secondary effects on other parts of the body can begin.

These conclusions having been fully confirmed by the observations of others, it was not necessary to adduce further evidence in support of them.

The report for 1868 is supplementary to the previous one. It is devoted to the more accurate definition of artificial tuberculosis, with special reference to the mode in which it modifies the structure of the affected tissues and the channels by which the tuberculous infection is conveyed and distributed.

Strongly impressed with the conviction that every pathological question must be approached from its physiological aspect, and that no disease can be really understood otherwise than as a modification of healthy function, Dr. Sanderson devotes nearly half of his report to the investigation of the minute anatomy of the parts which are the favorite seats of tuberculosis, and to the *comparison of the morbid products with the original structures*. As the result of this inquiry he arrives at the

following conclusions, the importance of which, if they are confirmed by further observation, cannot be doubted.

(1) The characteristic product of tuberculosis is not an aggregation of shrivelled particles of irregular form, but a tissue formed of lymph-corpuscles held together by a network of hyaline connective substance.

(2) There is a close structural analogy between this tissue and that of certain follicular organs belonging to the lymphatic system, *e. g.* the follicles of Peyer, the similar structures recently discovered in the conjunctiva and in the mucous membrane of the pharynx and the ampullæ of the lymphatic glands.

(3) All the favorite seats of tubercle, whether in the massive organs or in the serous or mucous membranes, are characterised by the presence of similar tissue, which, from the analogy stated above, might properly be called adenoid. Notwithstanding that this adjective has already been introduced into pathological nomenclature in another and entirely different sense, Dr. Sanderson prefers it to any other.

(4) The distribution of adenoid tissue in the body is in intimate relation with the arrangement of the lymphatic system. The author has for the first time shown that in the great serous membranes (which v. Recklinghausen's discoveries have taught us to regard as lymphatic reservoirs) it forms sheaths around the blood-vessels or masses of microscopical dimensions and irregular contour underneath the epithelium. In the viscera it is distributed here and there in the course of the lymphatic channels.

(5) In the peritoneum tuberculosis consists in the enlargement or overgrowth of these sheaths or masses of adenoid tissue, and consequently the tuberculous nodules which are formed have the same intimate structure and stand in the same anatomical relation to the vessels and the epithelium. In the organs the essential lesions also consist in overgrowth of pre-existing masses of adenoid tissue.

(6) The primary local lesion in artificial tuberculosis, whether it originates traumatically or by inoculation, consists in the development at the seat of injury of granulations or nodules, which have the similar structural characters with those of adenoid tissue elsewhere, but cannot as yet be shown to be in relation with the absorbent vessels.

(7) The first step in the dissemination of the tuberculous virus consists in its being absorbed primarily by the lymphatics (by which it is conveyed to the lymphatic gland, of which they are tributaries), and secondarily by the veins.

Having thus entered the systemic circulation, it is conveyed by the arteries to the serous membranes, by means of which it is distributed to the various organs contained in the serous cavities.

(8) In these organs those parts which are in relation with their serous coverings are first affected. From these the infection is conveyed by the lymphatics, exciting the adenoid tissue in its course, and thus giving rise to tuberculous new growths. The final stage of the process consists in the tertiary infection of the lymphatic glands of each diseased organ, which consequently undergo enlargement, induration, and eventually become caseous.

This enlargement is due to multiplication of cells in all the tissues of

the organ, but more particularly in the alveoli; the hardening to a process of fibrous degeneration, the peculiarities of which are carefully and minutely described in the report. The caseation consists in slow necrosis of the previously indurated and anæmic parts. From the first the gland is incapable of performing its functions, and from the moment that induration commences the absorbents of the organ to which it belongs are blocked up.

In the live guinea-pig tuberculous or, as it might be designated, adventitious adenoid tissue, undergoes fibroid degeneration and caseation, the results of which cannot be distinguished from those observed in the normal adenoid tissue of the lymphatic glands and of the spleen. Dr. Sanderson anticipates that it will soon be possible to show that in man, as well as in the lower animals, tuberculosis is an infective disease of the lymphatic system; and that while, on the one hand, the serous membranes play the most important part in the generalisation of the tuberculous infection, *i. e.* in conveying it to the organs contained in the great serous cavities, its distribution inside of those organs is governed by that of the lymphatic vessels.

On the Alterations of the Retina, and the Choroid in the Tubercular Diathesis.

Dr. Galezowski propounds the following statements:—1. In the first group of changes he ranks those alterations of nutrition in the retina which may exist in chronic phthisis, and which seem to depend upon interference with the circulation. Some consumptives have momentary difficulties of sight sometimes after cough, and examination with the ophthalmoscope generally shows engorgement of the retinal veins. It seems to be generally most strongly marked in the eye on the same side as the lung most affected. 2. The second set of changes are observed in the optic papilla when tubercular meningitis is set up. The central vessels become tortuous and masked at the border of the disc; sometimes they are not much changed, only their edges are a little concealed by surrounding exudation from vessels which are ruptured here and there. The first kind of appearance characterises optic neuritis, the second perineuritis. 3. Finally, the author mentions cases like those recorded by Auvray and Cohnheim, of tubercular granulations in the choroid. The ophthalmoscope shows spots or white nodules regularly rounded and without any pigment. Cohnheim never found tubercles in the choroid, except in subjects who have died of tuberculosis. Galezowski has observed them in the living subject in chronic phthisis. ('Gaz. Méd. de Paris,' 1868.)

Other papers on the subject of tuberculosis are—

Relation of certain uterine affections, especially leucorrhœal, to phthisis (Fawcett Battye, 'Transac. of Obstet. Soc.,' p. 237, 1867). On the changes in the retina and choroid in tuberculosis (Dr. X. Galezowski, 'Arch. Gén.,' Sept. 1867). Relations of tuberculosis to amyloid degeneration, in Grainger Stewart's paper on the cattle disease ('Brit. and For. Rev.,' Jan. 1868). Case of tuberculous changes in the choroid (Fränkel, 'Schmidt's Jahrb.,' 140, p. 140, 1868). Cases of tuberculosis with deposits in alimentary canal (R. Maior, 'Arch. d. Heilk,' 1867, p. 25). Tuberculosis of kidneys, &c. (Magnan, 'Gaz. Méd.,' 25, 1867). Schüppel and Rindfleisch, on anatomy of tubercle in liver ('Schmidt's Jahrb.,' 140, p. 132, 1868). See also the papers mentioned under 'Phthisis.'

Rheumatism.

Dr. Salisbury has discovered a fungus in the blood of rheumatic patients. He calls this *zymotosis translucens*, and depicts the spores and the branches of it; these, however, have no characteristic distinction from many other fungi which this author has described as present in many various diseases.

Dr. Salisbury recognises four different forms of rheumatism according to the amount of uric acid and urates of oxalic acid and its compounds of crystine or of phosphates in the blood. In all the cases of rheumatism observed by him, one of these four combinations was recognised in large quantities by its crystalline forms. He believes that these crystals prove the infiltration and obstruction of the vessels with the fungus above mentioned. The treatment should correspond with the chemical condition prevailing in the blood.—'Americ. Jour.,' Oct. 1867.

Dr. Day follows Prof. Mitchell, of Philadelphia, in favour of the origin of rheumatic phenomena from lesion of the spinal nerves. He thinks it has close relationships with cerebro-spinal meningitis. He thinks the result of Davies's blistering treatment corresponds with this idea, and he mentions a case of his own in which, by the simple application of cupping-glasses along the spine, he obtained a more rapid cure than he had ever done by other treatment.—'Med. Times and Gaz.,' Aug. 1867.

Fatal Rheumatism with High Temperature.

Some remarkable cases of this kind have been observed in England within the last two years. Dr. Ringer describes several in the 'Med. Times and Gazette,' ii, 1867, which appear to be of the same character as those previously described by various observers in Germany and France; they are distinguished by the suddenness with which a fatal issue occurs, apparently from loss of nervous power; but to Ringer and Kreuser belongs the credit of noticing the extremely high temperature, as much as 110 or 111 degrees, which distinguished a fatal attack. Dr. Weber reports very carefully two cases of this kind to the Clinical Society of London. In the first the patient, a man, æt. 45, had the ordinary symptoms of acute rheumatism till the twelfth day, when signs of endocarditis occurred, with great restlessness, deafness, noises in the head, excessive urination next day, violent delirium and vomiting, rapidly followed by coma and rise of temperature to 109·5, with intense fever. Death occurred five hours from the beginning of delirium, and the body rapidly decomposed. Of the second case, a young man, æt. 25, had seemingly an ordinary acute rheumatism, but with great depression of spirits. On the twelfth day signs of endocarditis occurred, with deafness, increased urination, and action of the bowels. Next day violent delirium, soon followed by coma and very high temperature; death three hours from beginning of delirium. Rapid decomposition after death; fluid state of the blood; ecchymosed spots underneath pericardium, pleura, and in tissue of lungs, also on liver and kidneys. The onset of fatal symptoms and the termination were remarkably alike in both these patients; both were highly nervous persons, and had

lately been subject to anxiety. In both no warning was given by the early symptoms of impending danger; the fatal symptoms occurred with great rapidity, and soon terminated in death.

Two cases are also related to the Clinical Society by Dr. Murchison; in the first one the delirium was the first serious symptom, and occurred upon the night of the fourteenth day; it passed more and more into stupor, and death occurred less than two days from the commencement of the head symptoms. Early decomposition of body, blood dark and fluid, spleen large and soft, kidneys enlarged and congested, their tubes gorged with granular epithelium. Nothing wrong in brain, except some congestion of veins and sinuses. Slight signs of recent pericarditis; muscular tissue of heart pale and fatty. The second case was a married woman, æt. 26, ill fed, and having suckled a child for three months. This was her second attack of rheumatism. On the night of the sixth day delirium occurred; for a short time the next day the temperature was 104½; there was no delirium, but there had been no sleep. In the night following, after an hour's sleep, obtained by opium, the delirium returned and passed on to coma; death occurred early the next morning. The dissection exhibited almost exactly the same appearances as in the last case, with the addition of waxy changes in the recti of the belly.

A case is also related by Dr. Burdon-Sanderson. This was an unmarried woman, æt. 45, of neuralgic temperament. This was her first attack of rheumatism, and the first serious symptoms occurred on the twelfth day of illness, and five days after the first rheumatic symptoms. The breathing then rose to 46, with sudden inspirations; there was a tendency to stupor. The lungs were congested at the lower part behind. Next day the pulse was 120, the breathing 56, the rheumatic symptoms were slight. The following day drowsiness continued, and in the afternoon the temperature was found to be 109·4, the suddenness of inspiration was more marked, and expiration was also sudden and stridulous, and the pause prolonged. An observation of the pulse under a spring pressure of 120 grammes showed a pulse curve of moderate size, and with no secondary markings, and much influenced by breathing. The temperature was again taken in an hour and a half and found to be 110·2; shortly afterwards the patient expired. For some time before death the eyes were closed, the pupils contracted, the iris had a tremulous movement, and was unaffected by light. On dissection there were slight signs of pericarditis, and similar changes in the blood and in the viscera to those noticed in the other cases.

Dr. Weber expressed the opinion that in this class of cases the brain functions, after a short stage of excitement, become paralysed, and that the symptoms of intense fever are not the cause but the effect of this paralysis. He compared them with certain cases of other fatal nervous diseases, such as tetanus, observed by Wunderlich, in which there was excessive rise of temperature, and pointed out the resemblance to the symptoms of sunstroke. He also referred to the remarkable experiment of Tscheschechim, who found that after section of the pons at its junction with the medulla the contractions of the heart, and the respirations were accelerated, and the temperature raised. He suggested that

all cases of acute rheumatism with more than usual restlessness should be watched with especial care. If the symptoms of danger were early noted good might be hoped for from the cold affusion, or other means of lowering the temperature, combined, perhaps, with large doses of quinine. —'Lancet,' Feb. 1, 1868, "Clinical Society's Transactions," 1868.

Venereal Diseases.

The controversy about the unity or duality of the syphilitic poison still goes on with great vigour. In this country opinion is leaning strongly towards the side of duality, the prevailing idea being that the indurated chancre is the only primary sore related to constitutional syphilis; but on the Continent authorities are quite divided.

On the side of unity, Dr. G. Lagneau maintains ('Gaz. Hebdom.,' 10, 1867) that the hard and the soft chancre are only varieties of the same thing, and that the supposed diagnostic differences are fallacious. The period of incubation of the hard chancre, instead of being always from fifteen to twenty days, is sometimes as long as twenty-five days, and, on the other hand, is often only eight or six days, and, according to Diday, may even occupy only one day; while the soft chancre, instead of having no sensible period of incubation, often has one of seven days. Even the character of induration Lagneau thinks is no real test, since induration is favoured by certain anatomical features of the tissue affected, *e.g.*, ulcers of the vulva are almost never, while ulcers of the head are almost always, indurated. Soft chancre may also undergo inflammatory induration, while infecting sores may commence as mere erosions. Lagneau quotes Galligo for instances of hard chancre accompanied by induration of many glands, *not* followed by constitutional symptoms, and Cullerier for cases of soft chancre in which constitutional syphilis *did* occur.

Dr. Léon Lebel argues on the same side ('Presse Méd. Belge,' 31, 1867), relating a case—which he says, is like many he has seen—where a man, being admitted to the hospital seven days after connection, exhibited chancres, and the woman who had infected him, admitted three days after the intercourse, displayed one large chancre at the orifice of the vagina. Local treatment only was applied to each patient; the man left the hospital in four weeks, cured, and without any sign of syphilis; the woman, on the very same day, showed indurated glands and a papular rash.

Prof. Wertheim (in an address to the Vienna K.K. Gesellschaft d. Aerzte) professes himself a strong unitarian as regards the theory of syphilis.

On the other side, that of *dualism*, there are a multitude of papers. But it is unnecessary to quote all these, since the arguments on this side of the question are exhaustively summed up by Mr. Berkeley Hill ('Syphilis and Local Contagious Disorders,' Walton, 1868).

Syphilitic deposits in Viscera.

Dr. Meschede relates a case of this kind. The patient, æt. 36, had long-standing constitutional syphilis; he had undergone several courses

of treatment; by this time he had become very thin, and had bad tertiary eruptions. He had severe neuralgia of the stomach. The external symptoms were soon removed by local treatment, but the gastralgia was obstinate; the case got worse and worse, and the patient died about three months after the commencement of the treatment, from pleuro-pneumonia. Dissection showed many ulcers in the small intestines; they were very deep, and their bases were stained with black pigment; those which had healed were represented by scars; small fibrous lumps were found in the peritoneum opposite the ulcers; here the serous and muscular coats were thickened. The duodenum was inflamed, and pylorus thickened; the liver was fatty, somewhat wasted at the edges, and its acini contained pigment. Besides signs of pleuro-pneumonia there were many irregular deposits scattered through the tissue of the right lung, of the kind well known as "*gummata*."

Prof. Gintrac reports the case of a man, æt. 43, who had suffered for two months before admission into the hospital at Bordeaux with pain at the chest and dry cough, followed in three or four weeks by mucous expectoration, slight fever, some wasting; no physical signs in the chest. It appears that fifteen years before, he had a primary sore, followed by constitutional syphilis; this was treated with iodide of potash successfully. The symptoms recurred at various intervals before the present illness. When admitted, the patient had no particular frequency of pulse; he seemed out of sorts and slightly wasted, and the temperature was rather high. The cough was frequent; the expectoration copious, thick, and purulent; the voice not changed. Shape of the chest natural, no flattening. Percussion normal over the whole right side; on the left side, in the middle of the anterior portion of the lung, there was a clearly circumscribed spot of dulness. Auscultation by several physicians detected no abnormal sound and no prolonged expiration, except at the spot of dulness; here there was cavernous breathing, mucous rattling, and pectoriloquy. Iodide of potash was given, at first 4 grains daily, increased gradually to 32 grains. After twenty days of this treatment expectoration lessened, the sounds of a cavern were greatly diminished. In about six weeks from his admission expectoration had ceased, there were no moist râles, there was only a peculiar slight sighing, probably produced by the flattening of a bronchus. A fortnight later the patient left the hospital without cough, and apparently well; percussion was everywhere clear. Auscultation revealed no mischief anywhere.—'Journal de Bordeaux,' August, 1867.

Dr. Wilks ('Practitioner,' July, 1868) also relates an interesting case of a gentleman, æt. 40, the subject of constitutional syphilis, who was greatly wasted, and had most of the symptoms of consumption. He was treated with 15 grs. of the iodide and 2 grs. of quinine thrice daily. At the end of three months the auscultation signs had greatly improved, and, ultimately, Dr. Wilks believes he was entirely cured.

In the same paper Dr. Wilks relates a case in which constitutional syphilis caused symptoms closely resembling cancer. The patient was greatly wasted, his liver immensely enlarged, and a lump the size of the fist was found lying near the pubes; the case was at first regarded as

cancer of liver and omentum. There was no history of syphilis, but Dr. Wilks ordered him a few grains of the iodide and bromide of potassium. In a couple of months the general symptoms were very much better, but there was a hard gland in the neck, and another lump in the sternum. Perseverance in the use of 5-gr. doses of iodide reduced the liver in size, removed the induration of the glands, and ultimately quite restored the patient to health.

Mr. W. Smith reports a case of melancholia apparently caused by syphilis ('British Med. Journal,' 393, 1868). The patient, who was a young labourer, was silent and self-absorbed, besides having some delusions. Examination of his body discovered a syphilitic roseolate eruption, with a few scattered scaly patches. Iodide of potassium, combined with a mild mercurial, was at once administered. In fourteen days there was improvement, and in a month complete cure.

Treatment of Syphilis.

Dr. G. Lewin writes a most interesting and elaborate paper ('Ann. der Berlin Charité,' xiv, 1868) on the treatment of syphilis by the hypodermic injection of corrosive sublimate. He injects at indifferent places, selecting the most convenient site for the operation. He employs a solution in which the dose (1-8th gr.) is contained in about 15 minims; if more than this dose is required to be injected at once, it must be done at two places. If the skin be very sensitive, 1-8th to 1-10th gr. of acetate of morphia, with a little glycerine, may be added to the injection. The doses of bichloride used varied between 1-8th and 1-4th of a gr. The best time for injection is the forenoon; if time presses, however, it may be done between 3 and 4 p.m.; and the author has even occasionally made three injections in one day—morning, noon, and night; it should not be done too late, lest the pain should prevent sleep. The patient should wear woollen underclothes; on warm days he may go out. It is needful to wash the mouth and teeth sedulously and carefully, in order to hinder salivation as much as possible; and Lewin generally gives about 10 grs. of chlorate of potash three or four times daily during the treatment. Neither mental nor physical toil must be undergone, although the patient may engage in light occupations. The only inconvenient consequences of the injections recorded by Lewin which appear to deserve attention are a few examples of mercurial poisoning. Doses of $\frac{1}{4}$ to $\frac{1}{2}$ gr. in women, and of $\frac{5}{8}$ gr. in men, provoked gastric irritation and pain, a bad taste in the mouth, and insomnia. Doses of $\frac{5}{8}$ gr. in women, and $\frac{3}{4}$ to 1 gr. in men, caused severer gastric irritation, with vomiting, sharp colic, tenesmus, bloody diarrhœa, giddiness, fainting, and coma. The pulse, at first hurried, sunk to 60 and 40 per minute. These symptoms were successfully treated with opium, quinine, wine and ether.

500 patients were treated on these principles; a good many of these, however, were also treated with iodide of potassium, or had a previous course of sarsaparilla, and, as above mentioned, the majority took chlorate of potash. Of those treated with the injections of bichloride only, it was found that, on the average, 3 grs. of the remedy, given at sixteen

injections, was necessary to the cure. In patients who had undergone a previous four weeks' treatment with sarsaparilla, only 2 grs., in nine injections, were needed. Women only required $2\frac{1}{4}$ grs. of the sublimate when used *alone;* when iodide of potash also was used, they required $1\frac{14}{15}$ gr.; when sarsaparilla was used, $2\frac{3}{5}$ grs.; when chlorate of potash was used, $2\frac{3}{5}$ grs. Mercurial affections of the mouth were noticed in 195 out of the 500 patients; the salivation lasted, on the average, seven days.

As regards the comparative frequency of *relapses* after the bichloride injections, as compared with other plans of treatment, Lewin calculates that these accidents occurred in 38 per cent. of *all* the cases treated by mercurial injection, and that this proportion is 44 per cent. less than the frequency of relapses after the ordinary mercurial and vegetable treatment. In the cases treated with injection alone the number of relapses amounted to only 31 per cent. The symptoms were *severe* in only 3 out of 89 cases.

Grünfeld also communicates ('Archiv f. Dermatologie u. Syphilis') some observations on the use of subcutaneous injection of corrosive sublimate for the cure of syphilis. He had twenty-five cases. The local irritative symptoms were of very little consequence. There was no abscess in any case, but if the solution was too concentrated there is a tendency to gangrene of the cellular tissue. He recommends the injection to be made either at the chest, the hypochondrium, the back, or the nates. It should not be done in the neighbourhood of lymphatic glands. The best places for producing a quick effect on the system are those where the skin is thinnest. Grünfeld recommends the injection to be made daily, or in a few cases twice a day; he pushes the syringe deeply. When this is done no unpleasant irritation follows.

Dr. J. Purdon, of Belfast, recommends the use of sulphurous acid spray for syphilitic ulcers of the larynx. In a case which he reports he applied the acid three times a day, putting the end of the spray-tube quite near the ulcers, and injecting seven minutes at a time. The ulcers were healed in twenty days. He also has applied the same method in syphilitic affections of the tongue with the best results.

Mr. Holmes Coote relates the successful results of carbolic acid treatment in the following cases:—(1) A girl, suffering from white discharge and numerous mucous tubercles on the external labia, was rapidly cured by the use of a solution of five grains of the acid in an ounce of water. (2) Another girl, with the same affection more severely developed, had a solution of equal parts carbolic acid and water applied daily with a brush, besides the application of the weaker solution on a rag; she was cured in twelve days. (3) A similar case was cured in fourteen days; in this case there was no considerable pain. The critic who reports this case in the 'Archiv' remarks that he has obtained no good results from the use of the acid for mucous tubercles. He also finds that a great deal of pain is given, even by much weaker solutions.

The treatment of syphilis, especially in regard to the use or disuse of mercury, has excited great discussion lately in France. A paper by

M. Dolbeau, read before the Society of Surgeons in Paris, caused very warm discussion.

Dolbeau does not consider mercury strictly a remedy for syphilis; in certain cases it may put an end to the symptoms, but the disease itself still exists. In other cases, if it is not entirely effectual, it gives the patients great relief. But it is not able to prevent the return of symptoms any more than it prevents the outbreak and progress of syphilis. It is not proper to use mercury before the unmistakable signs of constitutional syphilis have appeared. If in this stage syphilis be treated with mercury, or bichromate of potash, or any other drug, in a number of cases it reappears in the tertiary form after a series of years. In that case iodide of potassium is extremely useful; its action does not depend, as some people suppose, on mercury having been previously used.

M. Cullerier expressed the opinion that syphilis should not be treated till it shows the clearest secondary symptoms, because otherwise the regular course of the disease is destroyed. In the later periods of syphilis mercury is no longer used. It is also a fact that many people are cured altogether without mercury. The most prudent course is to heal secondary symptoms with mercury, and tertiary symptoms with iodine.

M. Perrin, as the result of a very large experience of the comparative use of mercury with indifferent treatment, believes that mercury has no power to prevent the outbreak of the symptoms of syphilis, that it does not effect anything against the diathesis, and that its whole operation is confined to putting an end to secondary symptoms; these may, however, return at any time. Bonnafont speaks in a very different tone. According to this author there are only half as many relapses after the use of mercury as where it has not been employed. Perrin declares that mercury given at the commencement has no power to delay or exclude the later symptoms of syphilis, but it weakens the first secondary symptoms strikingly, and shortens the eruptive period, or even prevents it altogether; it assists the cure of sore throat and mucous tubercles, and rapidly cures the skin spots. Slight though these results be, there is the more reason for giving mercury in the secondary stage, because of the tendency to dangerous iritis, against which the drug is very effective. The best plan of treatment is as follows:—The primary ulcer should be only locally treated; distinct secondary symptoms should be treated by rubbing in blue ointment; salivation should be avoided. All relapses should be treated in this way.

Verneuil laid down the following maxims:

(1) Syphilis may be treated as soon as the diagnosis is certain; there is no reason for delay; for although the expectant method gives a clear view of the nature and the course of the disease, precious time is lost by it.

(2) The treatment must be long and patient; syphilis takes at least two years for cure.

(3) Syphilis may, no doubt, be cured spontaneously, but this is rare.

Treatment is sometimes vain, but this is only the same as happens in all other departments of therapeutics.

(4) Mercury still seems the most powerful remedy for the first stage.

(5) At least it must be allowed that mercury is as powerful as any other drug; it is not to be replaced by anything in inveterate syphilis, in visceral syphilis, and in syphilis of pregnant women and infants.

(6) The prudent use of mercury, with hygienic and tonic measures, never does harm.

(7) The problem how to treat syphilis without mercury is not solved, nor will it soon be.

(8) Bichromate of potash has no important advantage over mercury.

M. Velpeau spoke in the same tone. He thinks many cases which have been supposed to have got well without mercury are deceptive, because many patients take mercury without the knowledge of the doctor. Syphilis is only cured without mercury within a very narrow range. Nature herself may cure syphilis. This, however, only happens in good constitutions, with favorable conditions of life, and with a slight dose of the poison; but half of the cases treated without mercury are not cured, but suffer relapses. People who suffer from tertiary symptoms, and are not treated with mercury, are not well cured with iodide of potassium. Velpeau recommends most strongly Van Swieten's solution in the first stage, and for secondary symptoms. The good effect of this treatment is incontestable. The mercurial treatment should last three months.

Velpeau considers mercury to be as important in syphilis as quinine in ague.

M. Deprès strongly opposes the use of mercury; he does not believe there is a single instance of a poison in the body being neutralised by a drug. A tonic system of treatment is the only proper one for syphilis, and the apparent cures from mercury are really due to this having been adopted at the same time. The advocates of mercury are not agreed as to the proper time or dose of the remedy, nor the special way in which it should be given. Of 95 cases in all stages which he treated with tonics only, 7 or 8 per cent. experienced a relapse; of 101 cases treated with moderate doses of mercury, the recoveries were about the same; but of 13 cases where large doses were given, 2, or 15 per cent., relapsed.

Deprès quotes the authority of Dubic, and mentions several particular cases. One patient took blue pill for twenty-five months and got no good; another, a patient of Diday, took 1200 mercurial pills in eighteen months without the least benefit; the treatment was begun early, but exercised no influence on the course of the disease.

The physiological action of mercury is a poisonous one. There is no proof of the supposed influence of mercury on syphilitic deposits.

M. Depaul strongly criticised the arguments of Deprès, remarking that his cases had not been long enough observed; besides this, some were cases under other physicians, and it was not known in what way the mercury had been given; moreover, some of the patients, supposed

to be cured, applied at other hospitals in a week or two afterwards, suffering from mucous tubercles, and other symptoms of syphilis.

Depaul believes that, though mercury is no specific, it is yet the best remedy for syphilis.

M. Panas had observed carefully 100 cases treated with mercury, 40 of which had not yet shown secondary symptoms at the commencement of treatment. In spite of this early treatment secondary symptoms appeared. Mercury is, however, strikingly useful in preventing those febrile intercostal, neuralgic rheumatic pains which come between the period of the chancre and that of secondary symptoms. Rheumatism is especially to be guarded against by an early use of friction.

M. Diday divides syphilitic cases into two groups—those in which you *must* give it, and those in which it is to be avoided. Cases which commence mildly are to be treated without mercury, but those which threaten serious lesions must be treated with mercury; the treatment should begin fourteen days before ordinary appearance of the eruption.

The ointment of nitrate of mercury should be rubbed in every night for eight days, and then the friction should be ceased, or earlier if salivation appears. Simultaneously very small quantities of iodide of potash should be given. The treatment must be resumed at every relapse; the treatment differs seriously from the plan of giving mercury for one, two, three, or six months, or a year together, in smaller or larger doses. Mercury does not prevent secondary symptoms. The superficial and slighter symptoms of external syphilis do not require mercury. On the other hand, syphilis of internal organs does require it. In psoriasis of the hands, and in mucous tubercles, it is useful, and local treatment is of the highest value. Tertiary symptoms are not affected by mercury if iodide of potash fails; in this case a great improvement is often effected by *moral and mental* influence, of which, strange to say, Diday recommends mercury most strongly. Syphilis, like all contagious diseases, is a parasite, and has its period of incubation, which differs according to the original nature of the poison.

M. A. Guérin does not believe that mercury is a remedy for the symptoms of syphilis, as Diday thinks, but that it removes the cause of the syphilis, *i. e.* the virus, whereas Diday considers that mercury should only be given in severe syphilitical affections. Guérin recommends it in papular and pustulary eruptions, but forbids it in indurated chancre and mucous tubercles. He maintains that mercury does cure syphilis, and every attempt ought to be made to produce actual cure by prolonged treatment; it should be given for some months, and then discontinued for a time and again resumed.

Guérin prefers the iodide of mercury with opium; he alters this now and then to fumigation; he does not think well of inunction.

M. Le Fort has treated all his syphilitic patients at the Hôp. du Midi for the last two months without mercury, but considers the method very dangerous. A skin eruption appeared in the majority, and after two months was as bad as at first, while mercurial treatment was found to get rid of it in two or three weeks. He speaks highly of the bichromate of potash recommended by Dolbeau. He considers that as regards mercury it is still doubtful how long it should be given,

and in what doses, which are the best preparations, and whether iodide of potassium should be given after it. The proper treatment of mucous tubercles is also doubtful. Again, supposing a patient with secondary or tertiary symptoms has never had mercury, need we give him a course of it before using iodide of potassium? As regards inunction, he speaks very highly, but in practice does not use it. He recommends corrosive sublimate as soon as the constitutional symptoms have appeared, and to be continued for some months. He believes that iodide of potassium is only effective when mercury has been previously given ('Union Méd.,' 1867).

Other papers, &c., on the subject of constitutional syphilis are—

Diagnosis and treatment of brain-syphilis (Dr. Diego Coco, "Il Morgagni," 'Schmidt's Jahrb.,' 138, p. 24, 1868). Connection between pemphigus neonatorum and syphilis ('Memorab.,' xii, 10, 1867; 'Schmidt,' 138, p. 200, 1868). Syphilitic affection of the testes (Bertholle, 'Union Méd.,' 5, 1868). History, pathology, and treatment of syphilis (Dr. A. Geigel, 8vo, Würzburg, 1867). Obscure case of inveterate syphilitic ulceration, complicated with sycosis (Gnibout, 'Union Méd.,' 61, 1867). Syphilitic tumour of the brain; congestion of optic papilla seen by the ophthalmoscope (J. W. Hulke, cases of optic neuritis, 'Ophth. Hosp. Rep.,' April, 1868).

Gout.

Dr. Charcot analyses the causes of gout:

I. Individual causes.—(1) *Spontaneous development.*—Charcot considers that there is sufficient evidence in favour of the idea of a constitutional predisposition which favours the development of gout spontaneously. External circumstances, by accidentally increasing the amount of uric acid in the blood, produces gout in these subjects.

(2) *Hereditary predisposition.*—Charcot quotes the statements of various authors to prove the frequency of hereditary transmission. Hereditary gout is often premature, appearing before the age of thirty or thirty-five; it is apt to appear about the same age in all the members of some families.

(3) *Sex.*—Females enjoy a great immunity from gout; where it occurs in women it ordinarily happens at the change of life. In this respect it differs from chronic rheumatism, which usually appears much earlier in life. Women are also most subject to the low type of gout.

(4) *Age.*—As a rule, the most usual period for gout is between thirty and thirty-five, though the first attack may occur either earlier or later. Rheumatism, on the contrary, usually makes its appearance before this.

(5) *Constitution.*—No degree of original strength or weakness exempts any one from gout, but, as a rule, the type of the disease corresponds to the general strength of the system.

II. Hygienic causes.—(1) *Climate.*—Gout belongs almost exclusively to the temperate zone, although Europeans living in hot climates may suffer the disease if they continue the habits of their native country.

(2) *Full diet and want of exercise.*—These are always recognised causes of gout; it predominates also in the higher classes of society,

and may be said to be the result of a surplus of receipts. At any rate excess of animal food promotes it, and gluttons are very frequently affected.

(3) *Influence of the nervous system.*—There are many historical instances recorded which prove that strong intellectual exertion favours the disease.

(4) *Sexual excesses.*—No doubt these have an influence, but they are always liable to be complicated with other causes of gout, such as intemperance.

(5) *Fermented liquors and lead poisoning.*—As regards the first of these causes, it is now well proved that it is not the strongest liquors which most cause gout, but the malt liquors. As regards wines, the highest rank must be given to port, sherry, Madeira, Marsala, Burgundy, and hermitage. Cider, it appears, especially if new, is also mischievous. As regards lead, since the original statement of Garrod, a great deal of additional evidence has turned up, not only in England, but in France. The connection between lead and gout is extremely obscure, and Charcot does little more than quote Garrod's opinion; he thinks that probably lead paralyses the kidneys and thus prevents excretion of uric acid, but it is impossible to say whether this is sufficient alone to cause the gouty conditions.

III. Exciting causes.—(1) *Alcoholic liquors.*—In gouty subjects even small quantities of certain wines will at once promote gout, and wherever this occurs, according to Garrod, one may decide that the inflammation of the joints is gouty.

(2) Indigestion and other stomachic derangements act in the same way.

(3) Cold and damp and suppressed perspirations produce the same effect.

(4) Immoderate intellectual exertion may produce gout.

(5) The shock of injuries and operations may produce the same effect.

(6) Debilitating causes, such as loss of blood, long illness, &c., frequently excite gout, a fact which is interesting, as showing that gout is not necessarily connected with a strong habit of body ('Gaz. des Hôp.,' 12—15, 1868).

Durand-Fardel discusses the treatment of gout, and speaks in very high praise of the power of Vichy water to keep off attacks. He cannot at all agree with the opinion of Trousseau, who thought that the treatment of gout at Vichy was very dangerous; he thinks the only case in which the water should not be used are when the local symptoms present a very low type, or where the patient is cachectic; in this case Wiesbaden water is better.

In order to use Vichy water with effect the patient should not bathe till some time after the attack has subsided. In recent gouty affections, where there is no fever, this direct treatment is the best; but where there is fever, poultices of linseed meal, changed very frequently and sprinkled with laudanum, are best for the pain.

Durand-Fardel forbids the local use of ice, and also of drugs, espe-

cially colchicum. The latter should only be given when the attack is irregular and protracted, and should then be combined with quinine and digitalis. In all other cases this remedy acts badly, especially in interfering with the general health, producing more or less cachexia ('Bull. de Therapie,' lxxii, pp. 93, 241).

Inflammation and Suppuration.

The most important researches on this subject which have been made for many years are those of Cohnheim. In an elaborate paper ('Virchow's Archiv,' Sept. 1867) he brings out the following facts. Referring to the researches of His and Struve, he illustrates the results of artificially produced inflammation of the cornea. It is generally believed that under these circumstances the stellate corneal corpuscles increase in size and develop either by splitting of the nuclei and cell-substance, or by the production of young elements from within, which are pus-cells.

More careful examination shows that the new cellular elements are not only pus; on the contrary, it can be seen that the ordinary corpuscles of the cornea are present in exactly their ordinary distribution. The pus-cells exhibit a great variety of shapes, corresponding with their natural contractility. At a later stage the stellate corpuscles are also seen arranged in successive parallel layers, with the pus-cells irregularly dispersed among them. The curious fact, however, is observed, that the pus-corpuscles change their places; by reason of their contractility they *migrate*. The question now arises, whence are the pus-cells derived? They may either have come from the migrating lymphoid elements pre-existing in the cornea, or may have migrated from without. Putting aside for the moment the case of simple artificial traumatic keratitis, as to which Cohnheim arrives at results not materially different from those of earlier observers, we may refer to his special experiments upon irritation applied at the *centre* of the cornea. If this be touched with solid nitrate of silver so deeply as to destroy the epithelium, and the surplus nitrate washed away with a solution of common salt, the dead part, under the influence of light, will become brown, the rest of the cornea remaining transparent. After twenty or twenty-four hours, however, there is a narrow pale ring round the slough, and at a distance from it, separated by a broad piece of transparent tissue, we observe a cloudy, pale grey streak, while the centre remains unchanged. The external streak increases in size, both as to width parallel to the margin of the cornea, and especially towards the centre. On the third day the cloudiness has usually reached the slough from the upper margin in a wedge-shaped form, and somewhat later a similar wedge joins the centre from the lower border, while the inner and outer portions of the cornea may remain slightly or not at all affected. Later on, whilst the opacity around the slough becomes deeper, the periphery becomes constantly more clear; and on the fifth or sixth day there is only a milky or yellowish-white ring around the cauterized part, while the whole periphery is quite clear.

Microscopically examined, the tissues show the following appearances:—At first the only important changes are in the grey marginal

streak; there are numerous pus-corpuscles here, the greatest number being at the outer edge. Later, when the opacity concentrates round the centre, the pus-cells here also become extremely dense, while their number as much diminish at the margin of the cornea. The slough never contains pus-cells.

If the experiments be varied by setting up continuous irritation, as that of a thread drawn through the cornea and left, the opacity is continuous and the cornea swells, and even forms abscesses which may rupture. Cohnheim explains the fact that purulent infiltration always begins either at the upper or the lower border of the cornea by the fact that here the largest and most numerous blood-vessels approach the cornea. The above experiments were made on frogs; but very similar results were obtained in observations on rabbits, although the greater tendency to slough often interfered with the accuracy of observation.

These experiments made it very probable that the pus migrated into the cornea from without; and Cohnheim, in subsequent experiments, accordingly fed the animals with particles of insoluble colouring matter, hoping that these would render the pus-cells, which easily absorb such matters, very easily traceable in their course. In order to avoid fallacies, Cohnheim first experimentally proved that aniline blue introduced into the conjunctival sac, or injected into the anterior chamber, had no effect on the pus-cells of the inflamed cornea.

It now remained to be seen whether the lymphatics could be the channel of introduction. Aniline blue having been injected into a lymph-sac of the frog, the tissues show nowhere any pigment; but if we cause a keratitis, some of the pus-cells will contain blue granules. The number of cells thus stained depends pretty much on the quantity of colouring matter successfully introduced. These experiments still left it doubtful whether the pus-cells migrate directly from the lymphatic system, or by a more indirect road to the cornea, namely, by the blood-vessels.

It was already known, from the researches of Recklinghausen, that solid particles introduced into the lymph-sacs easily enter the blood-vessels; for the most part they were found in the interior of the white corpuscles. Cohnheim now experimented on direct injection of colouring matter into the blood with precisely the same results as those obtained by injection of the lymph-sac. No coloured granules are seen in the normal tissues, but if the cornea be excited its pus-cells will be seen to obtain colouring matter. These experiments, so successful on the frog, fail in the rabbit, probably from deposition of the pigment in the liver.

The researches were now extended to a highly vascular tissue, the peritoneum of frogs which had been previously poisoned with curara so as to render them motionless, the effect being kept up by successive small injections. The inflammation was excited by exposure of the mesentery to the air. Congestion is rapidly developed till a dense uniform redness is produced; in a few hours the whole looks cloudy, and the individual vessels become indistinct. In from fifteen to thirty-six hours the mesentery and intestine are covered with a soft layer of false membrane, which under the microscope is seen to consist entirely of

densely crowded contractile pus-cells, with a very few red bubbles, all imbedded in a slightly granular material. The first step in the inflammation is a dilatation of the arteries, which seems to begin immediately on the application of atmospheric irritation, and in ten or fifteen minutes may be very pronounced. It is uniform throughout; only here and there we may find a small spot where an artery is suddenly contracted, with an equally limited piece on the cardiac aspect of the same which is unusually dilated. The next stage, which follows more slowly, is that of venous dilatation. The final result, however, is that the veins and arteries regain their original proportion. At the same time the rapidity of the current begins to vacillate, and after about two hours a diminution of its speed is developed. We can now easily recognise the outlines of individual corpuscles. It can now be seen plainly enough that the white corpuscles tend towards the walls of the vessels; at the height of retardation they seem to stick there till the next wave carries them on. In the veins the outside zone of the current, the *original plasma-layer*, contains countless white blood-cells. Slowly, and sometimes jerkingly, several of these enter the field, and soon come to rest at some point of the wall of the vessel, either permanently or only for a time. By degrees the whole peripheral zone of the vessel is filled with white corpuscles. Within this wall the central red column of blood flows on with uniform rapidity.

Very soon the eye is attracted by a remarkable occurrence. On the external outline of the vein there arise several small colourless button-shaped elevations. These excrescences slowly enlarge till a half globe, about as big as half a white blood-cell, seems to lie outside the vessel. Later this becomes pear-shaped, with a pedicle attached to the vessel. Fine processes and points now begin to radiate from the margin of this pear-shaped corpuscle, which frequently changes its shape; the corpuscles move gradually more away from the vessel till their connection is severed.

There is now a colourless, shining, contractile corpuscle, with one long and a few short processes, otherwise just like a white corpuscle, altogether outside the vessel. The whole process of extrusion may occupy more than two hours.

In three or four hours from the commencement of this process the vein is surrounded by a single but dense ring of the corpuscles; and a few hours later swarms of them extend on all sides, the inner row still adhering to the vessel by their pedicles, while the outermost shorten their pedicles, and get to look just like contractile blood- or pus-cells. The interior of the vessels remains unchanged.

While the arteries and veins dilate, the capillaries become more distinct, probably not from dilatation, but from greater repletion with blood-corpuscles. The current in them is unchanged from the state of health, as to its direction, rapidity, and uniformity. As in the veins, there is often a stagnating layer; but this layer contains red corpuscles as well as white.

In these capillaries, in which the blood-current continues uniform, no change ensues; but whenever there is partial or complete stagnation we observe, in the first place, amœboid changes of form in the

colourless cells, and, soon after, the same protrusion through the wall of the vessel as has been described in the case of the veins. But in the capillaries not only white, but also red cells escape through the walls. A singular element in the migration of the latter is the length of time during which they sometimes remain sticking *in transitu*. In this position it sometimes happens that their inner half is torn off and carried away by the blood-current.

Nothing is more interesting than the demonstration which Cohnheim's experiments afford, that the whole business of cell-formation in inflammation of a serous membrane is performed by the migrating corpuscles, and that the epithelium-cells have nothing to do with it. If the latter perish at all it is only by being cast off.

Cohnheim followed the process of inflammation up to the point where the mesentery is filled with crowds of contractile cells, and also covered on both sides by a fibrinous layer filled with such cells.

Attempts were made to exhibit the same phenomena in mammalian animals; and although the experiment is less satisfactory, substantially the same facts were observed, as to the migration of cells, as in the researches on frogs. Cohnheim has no doubt that the experiments thus performed on the mesentery fairly represent the pathological processes in inflammations of other parts. He leaves it doubtful whether emigration of white cells be the only source of pus, but is disposed to deny that the corpuscles of a connective tissue ever produce pus-cells by division.

Alcoholism.

Professor Leudet, of Rouen, describes ('Arch. Gén. de Méd.,' Jan., 1867) a variety of chronic alcoholism, in which the predominant symptom is *pain*, and which he thinks is more common than is generally supposed. The pain varies in intensity; it is generally deep-seated, but sometimes superficial; occasionally it assumes the form of a remarkably exalted sensibility of the whole trunk and limbs. There is often at the same time pain along the spine, analgesia or anæsthesia in certain parts of the skin, weakened mobility and muscular power, especially in the lower limbs, cramp, and increased reflex movements. This form of alcoholism is sometimes followed by paraplegia. The pathological explanation of these symptoms is found in a morbid alteration of the spinal cord. They are liable to remarkable variations, and when they disappear they often leave behind them a more or less marked impairment of the motility in the lower limbs.

Dr. Anstie discusses the whole subject of alcoholism, both acute and chronic, considering it, for the purposes of the physician, as a disease of the *nervous system*. It manifests itself usually in a chronic, and only occasionally in an acute form. Anstie regards the exciting causes of alcoholism as consisting in the repeated direct action of blood strongly impregnated with alcohol on the tissue of the nervous centres and branches, rendering them incapable of the due performance of their functions, and of the influence of an insufficiently oxygenated blood supply, consequent on a morbid condition of the blood-corpuscles. Alcohol in small doses unquestionably acts, not as a poison, but as a food;

and recent researches have showed that its complete elimination from the body without chemical change was a mistaken theory. When poisonous doses, however, are taken, whatever may be the exact way in which the surplus is dealt with in the organism, it is certain that there is a greater tendency to elimination of unchanged alcohol. But the mass of the superfluous alcohol circulating in the blood, and with difficulty undergoing assimilative changes, acts as a poison to all the tissues, and more especially to the nervous system.

Of predisposing causes of alcoholism, besides the mere circumstances of temptation in which persons are placed by unusual opportunities of getting drink, Anstie mentions with emphasis the powerful influence of physical and mental misery; and also dwells on the tendency of individuals belonging to certain highly neurotic families to inherit a fatal predisposition to drink. Persons who are descended, either directly from drunken parents, or even from families in which the severer nervous diseases are prevalent, are unquestionably more prone than others to the vice of intemperance.

In his description of the symptoms of chronic alcoholism, Anstie agrees, on the whole, with Huss and Marcet, &c.; but he insists on the fact (opposed to the general idea) that cirrhotic diseases of the liver and kidneys are by no means frequently so much developed among drunkards as to endanger life of themselves. Some other cause than drink, and that a powerful one, must plainly assist in producing the fatal forms of these diseases, even in drunkards. Under acute alcoholism the author specifies four varieties:—1. Delirium Tremens. 2. Acute Mania from Drink. 3. Acute Melancholia from Drink. 4. Oinomania. Under Delirium Tremens the chief point is the author's full acceptance of the modern doctrine, that it is not the discontinuance of alcohol, but the alcohol itself, which produces the tendency culminating in the acute attack. He therefore deprecates any use of alcohol in treatment, except in broken-down subjects: he forbids the use of opium, except in rare cases, and limits it strictly to hypodermic injection.

The basis of treatment should always be constant and careful feeding of the patient with *hot* broth, eggs, milk and bread, and other nutritious foods, in order to maintain the strength.

In most cases the malady, so treated, will run its course in a few days, and the patient will then recover the power of sleep and steadily convalesce. It must not be considered, however, that sleep in itself is so direct a curative that the first good long nap will place the patient out of danger. On the contrary, it is even not advisable to let him sleep too long at first without food; and on waking, his pulse should be most carefully examined to test the amount of heart-power. This can be done much better by the sphygmograph than with the finger; the arm, of course, being most carefully held steady. The indications of the sphygmograph are sometimes of priceless value, for whatever the patient's apparent condition, if his pulse exhibits a certain very soft and undulating curve, a fatal result is almost inevitable, the heart-power having become too much exhausted to recover itself.

Of digitalis, Anstie remarks that the apparent results obtained in this country are quite indecisive, as the tincture was nearly always used,

and the action was thus complicated by the influence of alcohol ('Reynolds's System of Medicine,' ii, 1868).

Tartar emetic is considered by Anstie a most dangerous remedy, only to be used in exceptional cases, and then with the utmost care and watchfulness.

Mr. John Higginbottom describes a variety of so-called rheumatism, which used to puzzle him very much, but which for many years past he has been able confidently to refer to the influence of alcoholic excesses. It would appear that he must be alluding to a similar kind of affection to that described above by Leudet.

Dr. Hermann of St. Petersburg, discusses the treatment of acute delirium tremens. We must, in the first place, recognise the fact that slight cases get well spontaneously. The critical sleep occurs usually about the seventh day, more rarely on the fifth, and in cases where drinking habits have only been recently commenced on the third or fourth day; when the illness lasts to the eleventh or twelfth day complications are to be suspected. Very large experience has convinced the author that remedies usually have little influence; even the largest dose of "nervic" drugs will not cut short the malady, and too great venturesomeness often does harm. The drugs most used are opiates, chloroform, digitalis, tartar emetic, acetate and oxide of zinc; certain stimulants, as alcohol, camphor, sambul; and, besides these, there are the use of cold, isolation of the patient, rest, baths, and moral influence. The oldest and most esteemed remedy is opium, but even this is no specific. Practitioners differ greatly about the proper dose; the medium quantity of 1 grain four to six times in the day is the most commonly used. In the Obachoff Hospital a grain dose is given morning and noon, and one 2-grain dose in the evening. Such doses usually do good, and may be continued for several days without mischief; but where the patient is continuously maniacal and bathed in sweat, the pulse over 100, and the first heart-sound weak and indistinct; as also where he does not talk loud but mutters almost inaudibly, and shows a disposition to sinking or to coma, or where no improvement occurs after five or seven days, opium is contra-indicated, and stimulants must take its place. Patients who resist every gastric remedy may be dealt with by subcutaneous injection of morphia. The author does not approve the digitalis treatment recommended by several English authors; he finds it ineffective, and thinks it dangerous. Chloroform is far below opium in utility. A tartar emetic mixture, with 3 or 4 grains in the 6 ounces, is useful in gastric complications, and in active congestion of the chest or head, especially in robust persons, larger and repeated doses readily produce *collapse*. Acetate of zinc (1 drachm in 6 ounces) has frequently proved useful; the author thinks it comes next to opium. Alcoholic stimulants and camphor are indicated in the case of old drinkers, also in relapses, and in cases where restlessness and copious sweating, with weakness of the heart, contra-indicate opium. Capsicum has been used by Hermann in several cases with decided benefit. He gives 2 drachms of the tincture diluted with water every three hours. He thinks that various other remedies of repute owe their apparent success to the result of *expectation*. Finally, he remarks that acute

delirium tremens is a capricious disease, and its prognosis always doubtful. Small local bleedings from the epigastrium, the cold affusion with or without the warm bath, a cool room, mental and bodily rest—these are the foundation of the treatment. The strait-waistcoat is often (!) unavoidable. In after-treatment bitter stomachics, with or without opium, wine, beer, or even small doses of brandy, are found useful ('Petersburger Ztsch.,' 8, 1867).

Dr. D. G. Burr reports some very interesting cases of alcoholism treated with drachm doses of bromide of potassium. Five cases are recorded, all more or less of an acute form, in which the treatment was completely successful. In a sixth it comparatively failed. Dr. Burr is of opinion that in the milder cases of delirium tremens, and especially in patients who are not amenable to the influence of opium, the bromide is extremely useful, having a powerful effect in producing sleep. In cases of more active delirium he would place more reliance upon opium. The following are the only bad effects observed to follow the use of these very large doses of the bromide—diarrhœa and a lack of co-ordinating power in the lower limbs, but both are quite temporary and pass off when the medicine is discontinued ('St. Louis Medical and Surgical Journal,' Nov. 1868).

Dr. Foehr, of Marbach, discusses the treatment of delirium tremens. He thinks that this affection is never a simple one at its commencement, but is always united with pneumonia or other acute disease, nevertheless, it is, no doubt, quite special in its features. All kinds of bleeding aggravate the malady. When there is a certain amount of fever, opiates are of no use; but as soon as the fever remits opium operates wonderfully, provided it is given in sufficient doses for the production of sleep. In 3 cases the author gave first 1 grain of acetate of morphia every hour, and produced sleep in five hours. The next evening, agitation returning, he gave four more such doses with success. In the second case a grain of opium was given every hour, and five doses produced a cure. In the third case, 3 half grains of acetate of morphia having proved ineffective, the author gave three doses of a grain each every evening, and in two days convalescence set in ('Journ. de Méd. de Bruxelles,' xlvi, 1868).—[See additional papers in index].

Malarial Fevers.

Dr. John P. Nash ('Lancet,' March 14, 1868), of the Madras army, has tried the use of strychnine in cases of ague in which quinine had failed. In the first case 1-16th grain was taken four times a day; the paroxysms were immediately checked, and the patient was well in five days. Cases 2 and 3 were those of young children, aged 9 and 11; 1-30th of a grain was taken four times a day in strong quassia. The cases were respectively cured in six and eleven days. Case 4 was an old and obstinate one, in which quinine had long ceased to act; 1-20th grain of strychnine was given four times a day, and the patient was well in eight days. Case 5 was also an old one, in which both quinine and arsenic had failed; 1-12th grain of strychnine was given four times a

day, and the patient rapidly recovered. Dr. Nash finds, from some official records reserved at Nercara, that 37 cases of ague had lately been successfully treated with strychnine, with a total expenditure of 1 drachm of the drug. The average period of recovery was the eighth day. In the 37 preceding cases treated with quinine, of which 14 ounces were used, recovery did not result till the twelfth day, and subcutaneous injection of quinine has received much testimony to its success in ague during the last year or two. Dr. Sequin ('New York Med. Rec.,' 41, 1867) gives a special testimony in its favour. The solution he uses is made as follows:—Sulphate of quinine 60 grains, dilute sulphuric acid 40 minims, distilled water 1 ounce; carefully filter the solution; 35 minims contain 4 grains of quinine. The solution may be varied by adding 4 or 6 grains of sulphate of morphia, which renders the injection less painful. It was found that this amount of acid did not render the fluid irritating, the real cause of irritation was leaving undissolved crystals of quinine in the fluid. A higher degree of acidity was also mischievously irritating. Four grains of quinine were needed to break an attack of tertian ague, and fully eight for a quotidian. The general estimate was that 1 grain by injection was equal to 4 grains by the mouth. The best plan is to give a 4-grain injection two hours before the expected attack. If necessary, and if there was time to spare, 4 grains were given four hours, and 4 grains two hours, before the expected chill. If the time was too short, both injections were given at once. The remedy appears to have been remarkably successful in the intermittent forms of fever, but, as regards the remittent form, the experience was small and not satisfactory. In about 10 congestive cases the results were satisfactory, though, as usual, the mortality was very great. In nearly all the cases, besides the injections, quinine and whiskey were given by the mouth.

Dr. Schramm describes the complications which are observed to attend intermittent fever during an eight years' residence at Bodenwöhr:

1. As regards the mucous membrane, he noted 10 cases of inflammation of the conjunctiva of the lids and eye without any neuralgia. The inflammation occurred paroxysmally or vanishing with the attack of ague, and was attended with lachrymation, dread of light, and severe pain [we do not understand why this should not be called neuralgia]; in one case it was preceded by intermittent fever, and in another by neuralgia mentalis. The type was eight times quotidian and twice tertian. Intermittent catarrh of the intestines easily cured by quinine, occurred in eight children and three adults; severe inflammation of the larger bowels, with great pain and bloody stools, was more common in adults than children; quinine seldom cured it alone, opium was often used, and sometimes calomel and jalap. Inflammation of the urethra, with swelling and purulent secretion, occurred soon after the aguish attack in one boy of five years. It disappeared under the use of quinine. Affections of serous membranes were rarer; only 1 case showed a distinctly intermittent type. The concurrent skin-affections observed were—pruritus once, erythema once, urticaria once, erysipelas twice, shingles once. These skin diseases had no relation to the paroxysms. Angina tonsillaris occurred once. Hæmorrhages from the womb were generally atypic, and quinine often did no good. Typical nose-bleed-

ings were common; bleeding from the lungs occurred only once, in a tuberculous subject; inflammations of the lungs were usually only remittent. Remittent fever was usually of a typhoid type and accompanied by bronchitis. External wounds (?) often took on an intermittent action, and were followed by neuralgia of this type; in all these cases quinine acted well ('Schmidt's Jahrb.,' 138, p. 176).

Dr. D. Scott, of Bellefontaine, Iowa, has examined afresh the value of chloroform in intermittents. He says, "In 20 cases after the administration of one fluid drachm each the chill was immediately arrested, with the exception of 1 case, in which the above dose was repeated in the hour; in 11 of the above cases the febrile stage was probably averaged; in the remaining cases the fever ran on about as usual, or, with few exceptions, terminating with profuse perspiration; in 8 of the cases the paroxysm returned on the succeeding day, and in 9 on the second day; 3 escaped, but were subsequently attacked in from 7 to 20 days; in the remaining case no reliance was placed on the curative properties of the chloroform, which I only administered for the purpose of abridging the chill, but was followed by large doses of sulphate of quinine as soon as the sweating stage was established" ('Amer. Journ. Med. Sci.,' Feb., 1868).

The use of the hyposulphites of soda, &c., as a substitute for quinine in periodic diseases, has of late attracted much attention in America (see 'American Journal of Medical Science,' Jan. and April, 1868).

Drs. Hampton and Turner treated a very large number of cases with 15- and 20-grain doses every two hours, and Dr. Hampton says the drug was equally effective with quinine.

Dr. Leavitt and Dr. Baxter also give very favorable testimony to this treatment. Dr. Chubb, of Cambridge, Ma., gives a more cautious opinion to the same effect. He thinks the hyposulphites are more useful where quinine is not well known or has failed; but he thinks that they are not to be relied on in the more severe pernicious fevers, and in general he thinks their action slower and less energetic than that of quinine.

Yellow Fever.

This disease was prevalent at Vera Cruz in 1865, and a surgeon attached to the Mexican expedition—Dr. Schmidtlein—gives an interesting account of the outbreak, which was, on the whole, a mild one, the mortality only amounting to 38 per cent. The whole 200 cases observed may be divided into abortive or trivial cases, and the severer forms with vomiting, jaundice, albuminuria, and brain symptoms. In the very severest, which ran a rapid course, there were vomiting of blood, convulsions, and petechiæ. The disease generally began, without warning, with some pains in the temples and sacrum, about the kidneys, and in the limbs, followed by severe depression and shivering. The temperature was that of continued fever. In the early days it reached at the highest 104° to 105·8° Fahr., but on the fourth and fifth days it fell to or below the normal standard. In fatal cases the temperature rose 3·6° Fahr. and more towards the close. Complication with pneumonia or hæmorrhagic pericarditis caused sudden elevation of

temperature; sudden fall of temperature followed abundant vomiting of blood. In the first hours of the disease the pulse was full and hard, and from 100 to 120, but it soon became soft and small, and if it remained like this for several days was a bad omen. In favorable cases the pulse fell simultaneously with the temperature below the natural standard. This fall also occurred when there was no jaundice. The latter symptoms were usually present at the beginning of the disease. The face was generally very red. There was seldom any sweating, but a warm sweat usually ushered in recovery, and a cold sweat foreshadowed death. In severe cases the eyes were glittering and dejected. Dissection usually showed that the brain was congestive in those cases. The stomach was commonly distended, so as to obscure the normal percussion sound of the liver; vomiting of bilious matters of food or of water occurred in the early stages of the disease. Vomiting of blood was always dangerous and generally fatal, but usually occurred on the fourth and fifth days. No apparent changes of the liver could be detected during lifetime. The kidneys occasionally not only secreted albumen and bile, but sometimes also blood. In severe cases there was suppression of urine. Of nervous symptoms, besides those mentioned above, there were jactitation, somnolence, stupor, convulsions of various kinds. The severe symptoms usually corresponded with a high degree of jaundice or albuminuria; they were probably dependent on bad blood-making. Convalescence occurred suddenly, but it was dangerous to omit the proper diet. Death occurred as a consequence of collapse from vomiting, or of increase of the nervous symptoms, or of hæmorrhage into the pleura and pericardium. Dissection always showed parenchymatous degeneration of the liver, with destruction of liver-cells and degeneration of kidneys, fatty changes in the heart, effusions of blood under the skin and mucous membranes; more rare were effusions of blood between the muscles, small laryngeal effusions, laryngeal apoplexy, hæmorrhage into the pericardium and infarction of the lungs; the intestinal glands were not swelled. The mucous membrane of the stomach showed countless small bloody effusions when there had been vomiting of blood, but there was no serious anomaly of the vessels ('Schmidt's Jahrb.,' 138, p. 303, 1868).

Typhus.

Dr. H. Zorn has made a number of experiments, in consequence of Willibrand's recommendation of the iodine treatment in typhus fever, to test this method.

He tried it carefully in 14 cases, 6 of which were slight, 4 medium, and 4 very severe. There were 6 deaths, 2 of which were directly from typhus fever and 4 from complications. He compared these cases daily in regard to the maximum and minimum of temperature and pulse with the average of the same in 69 cases of the disease treated by expectation. He found that the maximum temperature on any particular day was sometimes higher under the iodine treatment, and sometimes with no treatment at all. The maximum pulse-rate fell

under the iodine treatment from the ninth to the twelfth day, in the later days its fall did not seem to be influenced by the treatment. The return of normal pulse and temperature seemed not to be altered by the iodine. The favorable influence of iodine upon severe brain symptoms was not observed by Zorn. On the whole, he concluded that the apparent good effects of iodine in typhus had really been only accidental coincidences ('Petersb. Ztschr.,' xii, 5, 1867).

Typhoid Fever.

As regards the essential nature of the causes which produce this fever, nothing has been observed during 1867-8 which could disturb the belief, already so firmly established, that its generation and propagation is essentially dependent upon sewage contamination of air and of drinking-water. At least, Dr. Kennedy's writings, to be mentioned presently, are the only important exception. On the contrary, various striking detailed confirmations of this pathological theory have been afforded by the history of local outbreaks in this country, which will, of course, be referred to under the section of hygiene.

Dr. George Johnson has contributed the most novel communication, at any rate, upon the clinical aspects of typhoid. In a clinical lecture ('British Medical Journal,' March 16, 1867) he discusses what he calls the two opposite principles on which the *diarrhœa* which is so characteristic of this disease has been regarded and treated during the last quarter of a century. The practice under Dr. Todd was to give repeated doses of opiates and powerful astringents to check the diarrhœa; and this plan, according to Johnson, did not yield favorable results. He says that, so far from opiates tending to heal the intestinal ulcers which are the source of the diarrhœa, they only check the contractile movements of the intestines which are necessary to carry off the morbid secretions which the diseased surfaces pour out, and thus lead to accumulation of fluids, which decompose and give off offensive gases, which in their turn are injurious. He describes cases in which the persistent use of opiates and astringents had failed entirely to check the diarrhœa, which ceased at once on the mere discontinuance of these medicines. As a general rule, he recommends the giving of very little medicine of any kind in typhoid, the sparing use of stimulants (which, as a rule, are not to be given at all in the early stages), feeding with milk, beef-tea, arrowroot, and eggs. And he maintains that where there is much distension of the bowels by air and liquid it is best to *give a laxative enema, or else* (and this, he says, is usually better) *a dose of castor oil, with a few drops of laudanum, in some aromatic water.* This gets rid of irritant matters, and Johnson maintains that in this way the intestine really gets a better chance of the physiological rest which is so necessary to its recovery. He enumerates other sources of irritation about which there is no dispute. It is his disinclination to use active means of checking evacuation, however mild, which we speak of here as a novelty, or, at any rate, as in direct opposition to the practice of those English physicians who are most experienced in the practical management of typhoid. And although few such physicians now employ opium

systematically and in considerable quantity, Johnson is peculiar in ignoring the value generally attributed to single enemas containing a very few drops of opium in a small quantity of starch, which are so frequently administered with the intention of checking a diarrhœa which seems to be getting severe.

Sir W. Jenner, for instance, mentions this latter treatment with approval ('Med. Times and Gazette,' July 27, 1867), while condemning the routine use of opium in typhoid, which he will not sanction either as a remedy for the diarrhœa or for the irritation of the chest when bronchitic complications are present. He also mentions another very important point of treatment, as regards the management of kidney complication, which is more than ordinarily fatal. For this very serious affection he recommends the application of gentle local stimulation by warm poultices and hot fomentations, which may tend to restore the circulation which, from its weakness and the long maintenance of the dependent position of the parts (for renal complications mostly occur towards the end of the fever), has become passively congested. He condemns the use of stimulant diuretics, such as cantharides.

Dr. Murchison also takes a very different view from that of Dr. G. Johnson as to the import of diarrhœa in typhoid, and the desirability of directly interfering with it. He considers that its continuance is eminently depressing, and ought not to be allowed. The mineral acid treatment, which Johnson speaks of as a frequent cause of unnecessary irritation of the intestines, is for Murchison an important element in the treatment, and a means of limiting the tendency to diarrhœa.

Dr. Liebermeister describes the general results of treatment of typhoid fever at Bâle during the epidemic which lasted through the years 1865, '6, and '7. Between August, 1865, and the end of 1867, 1178, cases were treated, with 168 deaths, or 13·8 per cent. This mortality is much more favorable than that prevailing in epidemics of earlier years at the same hospital, although many circumstances, such as unavoidable overcrowding, were adverse to success. He describes the effects of a variety of treatments, of which it is unnecessary to mention any except those by calomel, by iodine, and by the cool bath. Calomel was given usually in 10-grain doses once, twice, and sometimes even six times daily, and, although it sometimes at first increased diarrhœa, its continuance usually stopped this. Usually, but not always, the temperature fell soon after the first dose. Salivation occurred in a few cases, but only slightly. Iodine alone, or together with iodide of potash, was given in small doses every 2 hours; it very rarely produced symptoms of iodism, and then very slightly. It did not seem to affect the temperature or the duration of fever. On the whole, the evidence appears rather favorable both to the calomel and to the iodine treatment, and especially to the former, as compared with expectant treatment. The treatment by the cool bath, however, seemed much more efficacious. Of 339 cases thus treated, only 33 deaths, or 9·7 per cent.; only 52 were slight cases, and excluding this the mortality was even then only 11·5 per cent. No doubt this is a higher mortality than that which has prevailed in some places, but it is greatly less severe than that observed

formerly at Bâle. The most powerful form of cool bath is a plunge, of temperature 61° Fahr., and 10 or 15 minutes' duration, or on Ziemssen's plan, a warm bath gradually cooled down to this level, and then kept at it for a little time. For very weakly patients it may be well only to continue the bath for 5 minutes. In private practice a convenient plan is the use of Preissmitz's cold packing for 10 or 20 minutes; its effect closely resembles that of the cold plunge ('Deutsches Archiv f. Klin. Med.,' iv, 3 and 4).

At the Rudolph's Hospital in Vienna they have employed ice very freely in the treatment of typhoid, and in general with great refreshment to the patients. Ice was given internally, and also applied externally. In one case, where there were blood and albumen in the urine, the use of saccharated iodide of iron in 2-grain doses produced a remarkably rapid improvement, after tannin and other remedies had failed ('Schmidt's Jahrb.,' 137, 1868).

An interesting outbreak of typhoid fever at Guildford, in the autumn of 1867, was reported upon by Dr. Buchanan (see 'Ninth Report of the Medical Officer to the Privy Council'). The chief importance of this epidemic was the accuracy with which, after some difficulties, its occurrence was traced to the use, on a particular day, of water fouled with sewage.

This, however, belongs to the department of hygiene; but there is a point, also, of great interest which comes out in the course of the investigation, viz. that the great outbreak of the disease occurred exactly fourteen days after the one day on which the water was distributed to the population of the higher parts of Guildford. This gives considerable corroboration to the opinion hitherto entertained on inconclusive evidence, that the period of incubation of typhoid is about two weeks.

Occurrence of two Specific Fevers at once.

Some interesting cases are reported by Monti ('Jahrb. f. Kinderk.,' 1868), and by Steiner, of this kind of complication. Monti reports a case in which measles and scarlatina were combined. The family in which this occurred was composed of five children—three boys of the respective ages of 10 years, 18 months, and 2 months; and 2 girls of 14 and 6 years. The two youngest boys and the younger girl had no connection with other children; the eldest boy and girl went to separate schools. In the boys' school there was a severe epidemic of measles. The boy appears to have caught the measles there. In the girls' school there was an epidemic of scarlet fever, and the eldest girl became affected with it in the middle of January. The child of 18 months caught the measles from the elder brother, and just as this was vanishing she showed symptoms of scarlet fever. The girl of 6 years was exposed to both contagions, and on the 21st January she exhibited feverish symptoms, apparently combining both affections. The eyes and nose and the throat exhibited the characteristic symptoms of the two diseases. On the third day a scarlatina rash was well developed; on the following day this somewhat faded, but some crescentic spots of measles were visible. The two eruptions vanished about the fifth or

sixth day, and the throat and nose symptoms then also disappeared. On the seventh day the first symptoms of desquamation appeared, and this was fully developed by the twelfth day. On the twentieth day the child was bathed, and pronounced well.

Steiner reports a case of smallpox and measles. A girl of 6 years was taken ill with rigors, feverishness, and vomiting, which increased during three days; on the fourth day the characteristic smallpox eruption appeared. Two days later, the fever still continuing, it was noted that the eyes were congested, and there was dry cough, &c. Next day there was profuse catarrh; the cough was worse. The breathing was quick, the pulse and temperature higher, and certain dark red spots like measles appeared. The following day the latter were more clear. On the next day to this the smallpox eruption had much subsided—that of measles was highly developed. The temperature went on diminishing on the night of the tenth day. There was a gentle sweat. The pulse had fallen next day to 96. The patient was dismissed, fully cured, on the twenty-second day.

Steiner also reports a case of measles and scarlatina. A child of 5 years old, scrofulous, was attacked with catarrh and fever and cough. Four days later the eruption of measles appeared. Inspection of the mouth and pharynx showed small, scattered, round, and very red spots on the palate. On the fifth and sixth days, the eruption still increasing, the child vomited repeatedly, and the temperature and pulse rose. The fauces were now much swollen and dark red, with a yellowish-grey secretion covering them. Besides the original eruption, the neck and back, and certain parts of the extremities, showed a uniform diffuse scarlatina rash. On the eighth day, the measles eruption being somewhat faded, but the scarlatinal eruption remaining, slight albuminuria and swelling of the submaxillary glands occurred, and the albuminuria continued on the next day. On the eleventh day there was still fever, and there was now blood as well as albumen in the urine, and also fibrous tube-casts. On the thirteenth day scarlatinal desquamation began. There was ordinary scarlatinal dropsy during the next fourteen days.

Dr. Montgomery Ward publishes an interesting case which strengthens the affirmation made by Dr. Murchison, and other high authorities on fever, that typhus and typhoid can coexist, or overlap, in the same individual. The theory, of which Dr. Kennedy has been the chief exponent, in favour of the fundamental identity of the various forms of what used to be called continued fever, relied for one of its strongest arguments upon the fact that the symptoms, and particularly the eruptions of both typhus and typhoid, have been observed in the same patient, in a considerable number of instances, within the course of an illness which only lasted some four or five weeks. But the advocates of the separate origin and nature of these fevers have, on the contrary, affirmed that these very cases form the best evidence that the diseases are radically distinct. The case, according to them, is strictly analogous to that of a typhus or a measles patient catching smallpox before he is well from the original complaint, of which there are plenty of recorded instances. Dr. Ward's case certainly appears to fit in with this notion

far better than with the idea of one common fever poison capable of generating all the phenomena of typhus and also those of typhoid and of relapsing fever. The patient was a young man employed nearly constantly in some very ill-ventilated underground wine-vaults, and somewhat addicted to drinking. He appears in some way to have absorbed the typhus poison, and while in the stage of incubation for that disease to have received a very strong dose of sewer gas from lying all night dead drunk, half immersed in a foul ditch close to a sewer. The typhoid symptoms appeared first, and were complicated with an attack of pleuro-pneumonia; but in the second week of his illness the maculæ of true typhus appeared, and he rapidly developed the intense cerebral depression of that disease. Although he seemed at one moment to be slightly improving, a critical perspiration set in about one week after the appearance of the typhus rash, and he succumbed the same evening ('Med. Press and Circular,' Feb. 13, 1867).

Hay Fever or Summer Catarrh.

Dr. Pirrie is of opinion that under the name of hay fever two distinct diseases are usually confounded; one of these is a markedly spasmodic affection, a true asthma, excited by the irritating influence which certain vegetable particles borne on the air, and possibly the benzoic acid developed by the influence of sunlight upon certain grasses at this particular time of the year, exert upon the bronchial membrane. Some individuals certainly cannot either go into the hayfield or be anywhere near a flowering meadow without cough and dyspnœa, sneezing, weeping, &c.; others, again, experience the same symptoms on smelling ipecacuanha, roses, or the vapours of iodine, &c. In all such cases the attack is unaccompanied by constitutional symptoms, is of short duration, and ceases when the patient leaves the deleterious atmosphere. The second form is also peculiar to summer, but it differs from the above-described disease in being attended with fever, in lasting longer, and in the predisposition which certain persons show to it. It depends on no irritation of the mucous membrane, but on the congested condition of the organs of respiration, which is produced by the weakening influence of temperature upon the cerebro-spinal and ganglionic system. It has, in fact, close relations to sun-stroke. It is much more common in the dwellers in towns than in country folk, who, of course, are more exposed to the odours of grasses than the former; and the patients frequently declare expressly that they got their illness from heat. The characteristic symptoms are weakness, loss of sleep and appetite, and especially pain and heat in the head, giddiness, noises in the ears, weeping, sneezing, and irritation of the nose, a sore feeling in the throat, which appears red and swollen, pain in chest, and difficulty in breathing, cough, and expectoration of mucous serous fluid, dry hot skin, variable pulse, and a long-continued weakness during convalescence. It appears that the ordinary remedies for catarrh are of no use in this disease. General nervous excitability and weakness seem to predispose to this malady. The best treatment seems to be rest in a cool shady room during the day, walking at the cool hours of the day,

and use of mild laxatives, and in the intervals of the attacks cool baths, douches, and sea baths, followed by friction of the skin, free exercise in the open air, nourishing diet and tonics, especially iron, and sometimes strychnine ('Med. Times and Gaz.,' July 6, 1867).

Diphtheria.

MM. Bricheteau and Adrian have made an important step to the improvement of the local treatment of diphtheria. They tried experimentally the effect of various solvents upon portions of diphtheritic membrane, and they found that lactic acid effected its dissolution very rapidly, far more quickly than solutions of soda and potash, bromine water, chlorate of potash, or common salt.

M. Dureau ('Bull. de Thérap.,' Sept. 15, 1868) states that he has applied lactic acid in practice with important results. He reports several cases in which he applied the solution of the acid with the best results, and he concludes by saying that it is an excellent remedy. It dissolves the false membranes perfectly, and effects a cure more rapidly than anything that has yet been tried. It is devoid of all disagreeable taste, a point of some value in treating children. Being a very innocuous substance, it may be used with safety even by the most inexperienced persons. Finally, if lactic acid be not a specific for all pseudo-membranous affections, it can by its action prevent diphtheritic infection, and that is a property of no mean value.

M. Barbosa has recently advocated very strongly the local treatment of diphtheria by insufflation of flowers of sulphur.

Influenza.

Dr. Tigri mentions, as a diagnostic symptom of influenza, a measles-like redness of the mucous membrane of the gums, which appeared on the fourth and fifth day of the disease, in a fatal case where there was a post mortem he found the same appearance on the mucous membrane of the windpipe. He considers influenza as an exanthema whose characteristic rash appears on the mucous membrane of the larynx, palate, and mouth ('Annali Univ.,' 202, p. 677).

M. Moutard-Martin and M. Petit describe an epidemic of influenza occurring at Paris in the spring of 1867; it was characterised by extraordinary weakness and depression of the patients, not merely during the acute disease, but for a long time afterwards, and was attended with great danger to consumptive and to elderly persons.

The Vaccine Virus.

M. Chauveau ('Gaz. Hebdom.,' viii, 1868), in a report to the Academy of Sciences, states that the humour furnished by the vaccine pustule is a serous product, analogous in its composition to ordinary pathological serous fluids. Neither chemistry nor the microscope reveals any specific element. According to C. Bernard, the common elements which compose the vaccine fluid acquire their peculiar properties by

simple isomeric modifications. Does this change, which establishes the virulence, affect all the elements of vaccine, or only some? M. Chauveau has experimented with one after another of the elements of vaccine separately. He comes to the conclusion that if vaccine be deprived of its solid elements, viz. the leucocytes and the elementary granular bodies, it fails to produce an inoculation, whereas perfect vaccine always succeeds. It may be supposed, therefore, that the activity of vaccine exists somewhere in its solid bodies, and M. Chauveau thinks that this is a fact of great importance, both with regard to the theory of virulence and also as to the physiology of the elements of vaccine.

Cholera.

Dr. H. Güterbock investigates the question of temperature in cholera. The following are the conclusions in which he sums up:

1. In the algide stage of cholera there is a striking cooling of the head and of the extremities in comparison with that which we see in other diseases.

2. In the algide state of cholera the temperature of the cavities of the body is the highest in the whole body, and can only be really estimated by comparison with the other parts.

3. In the cold stage, in the majority of cases, whether the result be fatal or not, the internal temperature of the body is high, very seldom normal, but rarest of all diminished. As yet there is no explanation of these facts, either in the symptoms during life or during the changes found after death.

4. In the cold stage the temperature is ordinarily increased at the approach of death, but does not seem to increase after death. There are, however, cases in which there is an increase of temperature during the death-agony, for no reason that can be perceived.

5. With the commencement of simple reaction there is an increase of temperature. Much more commonly there is a slight fall as regards the internal parts of the body, while the external parts get warmer.

6. In case of protracted reaction, especially asphyxia, the bodily temperature tends to sink below the normal line.

7. The inflammatory sequelæ usually, if not always, produce a distinct elevation of the bodily temperature.

8. During full convalescence frequently there is a normally high temperature without any serious consequences resulting therefrom ('Virchow's Archiv,' xxxviii, 1867).

Treatment of Cholera at Posen.

Among the curiosities which have turned up in the way of treatment proposed for cholera, one may mention the following by Dr. Viseur. He gives every five minutes from 5 to 20 drops of a concentrated alcoholic solution of camphor. If this is vomited, he immediately gives another dose until tolerance is established. After the first dose of camphor has been given he administers enemas lukewarm and with more or less

salt, the administration being continued till repeated percussion on the abdomen assures us that fæcal masses are present, especially in the colon. He says that these enemas produce striking amendment. During the period of intestinal paralysis he sometimes gives one or more large doses of ipecacuanha.

Viseur pays no attention to heating the body externally; on the contrary, he finds that the patients like the windows open from morning till evening. He does not believe in frictions. If there are cramps, he opposes these by extension and counter-extension of the muscles by skilful attendants ('Journ. Med. de Charprat,' 1867).

Scarlatina.

The length of the incubation period in various diseases is discussed by Dr. Besnier. On the subject of scarlatina he collects the following opinions. Frank, from his own observations, assigns the period of five days, without denying, however, that it may be shorter, such as even two days, or occasionally may be rather longer. Rilliet and Barthez only state in general that the incubation of scarlatina is shorter than that of smallpox. Empis agrees with various authors in putting it at from 24 hours to 12 days. A considerable number of cases of scarlatina have been known to have a short incubation period; for instance, Trousseau observed once an incubation period of 24 hours', Gintrac observed once a case of 24 hours', and another of 36 hours' incubation. Roger quoted similar facts in the discussion which took place at the Academy ('Gaz. des Hôp.,' lix, 1868).

Smallpox.

The incubation period of smallpox is very variously stated. Dr. Besnier remarks that the invasion occurs in some cases immediately after contagion. According to Stoll and Boerhaave, the period varies between 5 and 7 days. According to Marsh, between 4 and 8 days, in cases of inoculated smallpox; and between 5 and 21 days in natural smallpox. Guersant and Blache observed cases from 4 or 5 days, but in some cases as long as 20 or 23 days. Rilliet and Barthez put it at 1 to 4 or 6 days. Bouchut puts the period at from 6 to 14 days for children. Crusoe at from 8 to 11 days. Gintrac from 10 to 16 days. The latter believes that the period is of various length according as the children are constantly exposed to the affection or only come in contact with it momentarily. The only conclusion that can be formed from these statements is that the average incubation period of smallpox is from 1 to 2 weeks; and although Barthez has fixed as a minimum duration of the period 4 days, it is by no means certain that it may not be in some circumstances yet shorter; and besides this, it is questionable whether the incubation is the same in vaccinated persons and those who are not vaccinated, or whether the varying intensity of the consequent disease does not correspond to a longer or shorter incubation ('Gaz. des Hôp.,' lix, 1868).

Measles.

The incubation period of measles, according to Besnier, is very variable. He quotes Guersant and Blache as putting it from 2 to 7 or 8 days. They report, however, two cases observed by Boursieri, with an incubation period of 15 and 25 days respectively. Rilliet and Barthez give from 10 to 15 days, and in extreme cases from 6 to 21 days. Hecquet, from his experience of an epidemic in Abbeville, gives 3 to 18 days. Niemeyer from 12 to 14 days. Panum and Empis, 14 days ('Gaz. des Hôp.,' lix, 1868).

Fatty Changes in Pyrexial Diseases.

Dr. Concatto discusses this subject. He alludes to the difference between infiltration with fat and fatty degeneration, and compares them to the respective physiological processes observed in acute and chronic degenerations occurring in a healthy subject. The acute fatty changes of health may be illustrated by the formation of colostrum and the disappearance of the contractile fibres of the uterus after labour; the chronic form, by involution of the thymus gland of the breasts, and of the uterus in later life. In like manner fatty degenerations of disease run sometimes a short course, as in acute atrophy of the liver, and sometimes a long one, as in fatty degeneration of the blood-vessels. The author records two cases in which limited acute fatty degeneration was observed apparently as the result of a previous febrile affection. A man, æt. 72, in whom for two months a hard cancerous tumour of the glands of the neck had existed, and a peritoneal cancerous tumour of the size of a child's head, which softened and almost entirely disappeared after the outbreak of *pneumonia*. Death occurred on the tenth day, and at the site of the tumour in the neck there was found a softened spot with a quantity of fatty *débris*. The tumour in the belly was also in a less advanced stage of fatty degeneration. In the second case a high degree of fatty change of the heart was found in a hypochondriacal patient, who died with symptoms of paralysis of heart, a few days after he had been attacked with a severe fever, in consequence of a wound in the neck. The treatment in such cases must be stimulating, and should always (where the fever is high and long continued, or where there is a predisposition to fatty changes) include the use of remedies which can increase nervous power without making the heart's action more rapid. The author believes that an infusion of arnica with Hoffmann's liquor, or Haller's elixir, have produced very good results in many cases ('Riv. Clin.,' vi, 4, p. 97, 1867).

The use of Alcohol in Acute Diseases.

Dr. Gairdner, of Glasgow, read a paper before the British Medical Association, the object of which was to prove the following points:

1. Nourishment, not stimulation, should be the rule in acute diseases, milk being the principal nutriment. Beef-tea is not so effective for the purpose, and in typhoid fever it sometimes causes diarrhœa.

2. We ought to imitate the feeding of health as far as this is consistent with the altered state of things. We ought not to distress patients by working them to take food.

3. The legitimate use of stimulants is to quicken the digestion and *assimilation* of food, properly so called; therefore they should be given, if at all, with the food.

4. The doses of stimulant, and the kind of stimulant liquor, must depend upon a variety of considerations connected with the age and sex of the patient, &c.

5. In most cases of acute diseases in young persons they are not required, or, at any rate, needed in small quantities only. The effect of each dose should be constantly watched; it is far better to withdraw the stimulant altogether for some hours than to over-stimulate. It is almost certain that the mortality may be seriously increased in young subjects by continuous stimulation, even when no noticeable intoxication is produced. Continued stimulation tends to cause profuse sweating and dry tongue, to prolong the fever, and to delay the natural crisis. Typhus fever may be taken to be the type of acute diseases in relation to stimulating treatment; and the constant experience of late years has been all in the direction of diminishing the amount of alcoholic stimulants. The paper included specific references to the high doses of alcohol frequently employed by the late Dr. Todd in the treatment of acute disease, and a condemnation of this "routine" system of high stimulation in acute diseases.

Dr. Anstie, who takes a different view of stimulation, regarding alcohol mainly as a food, explains certain new tests, chemical and sphygmographic, by means of which the prognosis of acute disease may be rendered more certain, and especially the indication for giving or withholding alcohol may be rendered clearer. The papers, however ('Lancet,' ii, 1867), belong rather to the department of special therapeutics.

Amyloid Degeneration.

Dr. Murchison describes the symptoms of waxy liver; and discusses the causes of this affection. He confirms the opinion already expressed by Frerichs, that in tubercle of the lungs amyloid degeneration of the liver is rarely seen together with fatty degeneration. He supports his statement by 52 cases; 33 were males and 19 were women, all affected with tubercle. Fatty degeneration was found in 20, amyloid degeneration in 6; in 3 of these there was not only tubercle but caries. In 8 of the 20 women, along with fatty liver either the kidneys or the spleen were changed in spots. On the whole, therefore, there were 14 cases of amyloid degeneration out of the whole number; 11 were women and 3 men. The author records three observations in illustration of clinical history. The first of these was a case of a boy, æt. 7, dying of suppuration of the joints. The liver was very large and waxy. The second case was a syphilitic liver; in the third there was an irregular superficial deposit of waxy spots on the surface of the liver ('Lancet,' i, 1867).

Dr. Dickinson, writing upon the nature of the waxy substance, tries to establish that this affection depends upon impregnation with fibrin free from alkalies. He says that tubercular and other cachexies cannot be considered as causes of it. The only thing with which it is closely connected is suppuration, the cause probably being the loss of albumen and alkali from the blood, to which suppuration gives rise. He instances the encystment of the deposit in the connective tissue, its contractile tendency and its identity with the fibrin casts of the uriniferous tubes. The latter, just like the waxy deposit, are coloured red-brown with iodine. On the other hand, with the addition of sulphuric acid, there is no blue colour. This colour, indeed, is never seen except by those who are looking out for it. The close connection between suppuration and waxy degeneration is illustrated by 60 cases observed by Dickinson and others. In 46 there had been protracted suppuration; in 4 dissection proved that there had formerly been suppuration; in 4 there was albuminuria from granular kidneys; in 6 the causes were unknown. In 15 out of 27 of Grainger Stewart's cases there was suppuration, and in 9 the probability that it had formerly existed. All this leads to the conclusion that in every case in which suppuration has been going on a long time there is likely to be an amyloid disease, and if there is albuminuria and enlargement of the liver the diagnosis will be pretty certain. Dickinson explains the pathology thus:—He refers to the researches of Hasse and Lehmann, showing that pus contains twice as much alkali and albumen as the blood-serum; consequently prolonged suppuration must cause excessive fibrin and diminished alkalinity of the blood. The amyloid substance is characterised by its well-known peculiarities as a fibroid material. It is also free from alkalies. Iodine produces this characteristic reaction along with acids, but is lost on soaking the tissue in diluted solutions of potash and soda. Healthy tissue, when treated with a weak solution of sulphate of indigo, becomes clear blue, which soon passes into pale green. Amyloid tissues, on the contrary, become deep blue, which remains constant. This is a test quite as good as the iodine for recognising the amyloid substance. Chemical examinations of seven healthy with seven more or less amyloid livers showed that the proportion of potash and soda present was as four to three respectively. Finally, fibrin and albumen, after treatment with diluted muriatic acid, give the same reaction as the amyloid substance. It would be better, in short, in view of the facts now ascertained, to abolish the term "amyloid," and call the change in question a depurative degeneration, since suppuration is the most frequent if not the only cause of it. Treatment must be directed, not only to the restoration of the albumen, but also to that of the alkalies ('Med.-Chir. Trans.,' 1867).

Treatment of Ambulant Erysipelas.

M. Abelin's views on this subject are stated in a short paper. He considers that, of all the forms of erysipelas which attack children, this is the most serious one. He thinks that the best and most efficient external treatment is that of hot-water baths, which not only produce

good local effect in diminishing the tension and heat of the skin, but it exercises a very favorable influence on the circulating and respiratory organs. The respiration becomes slower and more complete, the secretions are restored, and the general tone of the system improved. The child is placed in a bath, at a temperature of 38° Cent., and gradually hot water is added till the temperature reaches from 40° to 42° Cent. After from ten to thirty minutes, according to the strength of the child, it is removed from the bath, wrapped in warm clothing, and kept in this state for a couple of hours. It generally falls into a deep sleep. In severe cases two baths a day may be given, and may be kept up till an improvement in the child's health is evident ('Bull. Gén. der Thérap.' and 'Practitioner,' Sept. 1868).

B. NERVOUS DISEASES.

Dementia.

Dr. W. A. Moore, of Dublin, has had his attention called to a curious connection between dementia and thoracic aneurism, which was illustrated in no less than three cases of the latter not very common affection which came under his own care. In the first, the patient, a man æt. 47, had a slightly pyriform aneurism engaging the posterior portion of the ascending angle and transverse portion of the aortic arch; the heart was fatty, its valves intact. The brain, unfortunately, was not examined. The man had been out of his mind on a previous occasion, and during his treatment by Dr. Moore symptoms of derangement again became apparent, and he was removed to an asylum, where he died. Dr. Moore has no doubt the aneurism interfered with the carotid blood supply, and thinks that reflected nervous irritation may also have played an important part in the psychological phenomena, though there is no absolute post-mortem proof of this. In the second case the patient, a shoemaker, æt. 44, suffered from pain at the top of the sternum, cough, and dysphagia, and also from anæsthetic symptoms on the left side of the face, heat of both ears, left ptosis, drooping of the left angle of the mouth, contraction of the left pupil, partial aphonia, herpes of left upper lip and chin and chest and shoulders; the superficial veins at the upper part of the chest were prominent. A prominent pulsating tumour extended from right sterno-clavicular joint across the sternum for more than inch below the left clavicle. Left radial pulse indistinct; respiration feeble over left lung. After an attack of epistaxis the contraction of the pupil, the heat of the ears, and the semi-ptosis, nearly disappeared; the other symptoms remained. About ten months later he was attacked with giddiness and severe headache, the articulation became very imperfect, memory was annihilated, and the mind generally much obscured; there was slight paralysis of the right side of the body and the face; this quickly became complete. The aneurismal signs remained unaltered during the next two months, but the paralysis and mental symptoms gradually disappeared. About twelve months from the accession of the hemiplegic paralysis the patient died, and it was

found that the left cerebral hemisphere was notably atrophied; both internal carotids were atheromatous, but the left carotid was impervious from the place where it seemed to issue from the aortic aneurism to its bifurcation. In the third case, a man, æt. 44, apparently was suddenly attacked in the night in such a manner that he was found completely insensible in the morning. He remained in a tranquil, non-stertorous coma, occasionally interrupted by attacks of vomiting, restlessness, and severe struggling. Pulsation of the heart and great arteries excited and plainly visible. The physical signs of an aneurism of the aortic arch were plainly recognisable. (While the patient continued insensible, or only capable of being very partially roused to intelligence by shaking him, it was noticed that his right arm was paralysed, and careful inquiry discovered that this had come on four months previously, after an attack of insensibility.) From about three weeks after his admission to the hospital his consciousness began to get clearer, and continued to improve for a fortnight longer, but his *left* arm then became paralysed for a few days. A month later (the tumour having steadily increased in size) he had become again "dull and idiotic;" a few days afterwards he was seized with furious delirium, after the partial subsidence of which there was great pain in the tumour. The disappearance of the delirium left him more rational than he had been at all. He died from asthenia two months after this. On dissection the hemispheres were found decidedly shrunken; the upper and outer part of both was of a dirty yellow colour. The arachnoid was thick, pulpy, and gelatinous; there was much subarachnoid fluid everywhere. The brain substance generally was "brittle." No emboli were found in the vessels, but large coagula occupied both pulmonary arteries ('Dublin Quarterly Journal').

General Paralysis.

Dr. Domett Stone records one of the most interesting cases of insanity that has ever been related. He classes it distinctly as general paralysis; and as the patient recovered, the incident would be most extraordinary, supposing the diagnosis to be correct. The subject was a young man, æt. 26, who appeared to have been at once mentally overworked, insufficiently nourished, and exhausted by masturbation. What is decidedly unusual in the early history of general paralysis is the fact that this patient's illness commenced with an epileptic fit; on recovering from this he at once appeared "strange," and began to manifest the grandiose delusions, the extravagant lavishness, &c., which are common in general paralytics. When brought to the asylum, twelve days from the date of the fit, his delusions were extravagantly lofty, and he displayed the most exuberant spirits, while at the same time his speech was difficult, his tongue tremulous, and his gait peculiar. His habit of onanism was detected by the watchfulness of Dr. Stone, and, by moral influence, he persuaded him gradually to give it up.

The beneficial influence of this change, aided, perhaps, by the use of cod-liver oil and other tonics, and by much care to divert his mind towards cheerful and wholesome subjects, was so great that one by one

his delusions and all his other symptoms disappeared, and on the sixty-first day from his entrance to the asylum he was discharged, perfectly well to all appearance, and having been so for several days. Dr. Stone makes these remarks:—"That excessive mental work, with insufficient nourishment and sexual excess, will cause paralytic insanity, is universally admitted. That the subject of this case had overtaxed his brain, and had always been neglectful as regarded his diet, was affirmed by his friends; that he was addicted to self-abuse is an indisputable fact. We may therefore reasonably conclude, I think, that the coexistence of these gave rise to F. G—'s insanity; of this there exists no doubt in my mind. Is it surprising, then, that abstinence from mental work, with nutritious diet, constant exercise, varied amusements, and the diversion of the patient's mind from some subjects and the drawing of his attention to others, together with medical treatment, should have had such a salutary effect, and have finally contributed most happily to the patient's restoration to health?" ('Lancet,' February 2, 1867).

Melancholia from Embolism of the Brain-vessels.

Dr. Joffe, of the Vienna Lunatic Asylum, relates a singular case. A woman, æt. 46, was seized with melancholia. She had enjoyed good general health until three years before, when she lost her husband and her two children. She had always lived a temperate life. She was suffering from delusions, such as that she had no blood and no bowels, that therefore she need not eat; that she would live for ever, but that her soul was lost. Organs of respiration healthy. There was a systolic murmur over the left ventricle; the second pulmonary sound was accentuated, the cardiac somewhat increased; there was evidently mitral insufficiency; appetite poor, bowels constipated, sleep quiet; the lower limbs rather cold, skin sallow, sensibility very much dulled; irritation of the skin produced no reflex movement; the sense of smell seemed almost altogether wanting, but the patient complained of a foul taste. The woman was mostly apathetic, and sat immovably still, only occasionally she suffered for a few days from anxiety, and then cried and complained. Pulse was 90, and somewhat fuller at this time, and she ate no food whilst the excitement lasted. After ten months' treatment she was strikingly better as regards her mental symptoms. One night soon after this she suddenly awoke from her sleep with a cry, and declared that she was everlastingly damned. Large doses of narcotics produced no effect. Great depression soon set in; slow pulse, which could hardly be felt; consciousness much obscured; her strength somewhat increased in the next few days, but she obstinately resisted food; the skin was altogether insensitive. Towards the end of the month her lower extremities became scorbutically coloured; a few days later profuse diarrhœa set in, and soon carried her off.

On dissection the skull walls were found very thick and dense, the dura mater materially distended, and with false membranes on the inner surface over the convexity of the hemispheres, with spots of blood. The inner membranes were thin, the hemispheres much wasted, with a large quantity of subarachnoid fluid; cortical substance pale, the white sub-

stance moist and soft; a few drachms of clear serum in the ventricles; in the pericardium a few drachms of clear fluid. The heart was soft, and its tissue fatty; the free edge of the mitral valve and the tendinous cords around it were shortened and thickened; in the neighbourhood of the free border there was a circle of tough, pale red vegetation; fluid and slightly coagulated blood in the cavities of the heart. Microscopic examinations of the false membranes and brain showed connective tissue-like matter, with hæmorrhage and with new vessels; the arachnoid, especially over the convexity of the hemispheres, was spotted with molecular formation; considerable spots in this were thickened with a fibrous formation, containing many roundish or oval cells, and often with granular nuclei. In many places there were bodies with concentric layers, containing in the middle pale molecules of various sizes; those bodies arranged themselves in numerous polypoid swellings on the arachnoid, which at their edges frequently showed a division, and in the interior a number of small pale bodies of various forms.

The vessels of the pia mater were half again as large as usual, contracted at some points, and much contorted, and filled with dark red blood. This dark red contents of the arterial vessels disappeared immediately on section, and the rest of the vascular stem down to its branches was filled with yellowish-white molecular masses, obviously of the nature of embolism. Usually an embolism was found at a bifurcation of the vessel, and extended a long way into the branches, without, however, filling these or the trunk of the vessel, so that there was not complete obstruction to circulation. The embolisms were sometimes more and sometimes less yellow in colour, and of a more or less minute molecular structure, and of varying firmness. The positions of the embolisms were on the convex surfaces of the frontal and posterior lobes of both hemispheres, and were of such a kind that a piece of pia mater taken from the foremost part of the frontal lobe showed under the microscope embolisms only in a few vessels, but in the neighbourhood of the central anterior convolutions there were embolisms in numerous vessels. In the tissue of the arachnoid and between the vessels there was a quantity of brownish-red pigment, and also in the ventricles, where the vessels were bordered with a broad hyaline margin and reddish pigment. The vessels of the pia mater were dilated even where there were no embolisms. Many capillaries of the pia were thickened and surrounded with fine fibres. In one place the capillary artery and all its twigs were enveloped in connective tissue. At some places the cortical substance showed its arteries dilated and filled with embolic masses. The embolism of the brain-vessels was of the same kind as that in the vessels of the pia. The nerve-cells of the cortex in the neighbourhood of the embolism were partly atrophied, partly filled with fatty bodies, and deposits of finely granular fat were found around embolic deposits. The finely granulated nucleated substance of the cortex was cloudy, dark coloured, and in many places filtrated, resembling the appearances in general paralysis. The spinal cord was also much altered; the central grey matter showed, at the lumbar swelling and in the lower part of the dorsal region, only a striking pigmentation of the large cells of the anterior horns. From the lower two thirds up to the

cervical enlargement the grey substance was morbidly changed. Both at the grey commissure and in the horns the grey matter surrounding the central canal was overlaid with numerous amyloid bodies, which were densest throughout the whole grey commissure. It is plain that embolism, produced by dislodgment of matter from the mitral valve, was the cause of all the brain symptoms. The patient had had two attacks of melancholia before, from which she had improved, but never recovered ('Vierteljhrsch. f. Psychiatrie,' i, 1, 1867).

Hypodermic Injection of Remedies in Mental Diseases.

Dr. Reissner records the result of a large experience in this mode of treatment of insane persons. Of the six alkaloids of opium, he found morphia, codeia, and narceia useful; while thebain, narcotine, and papaverine seemed to be useless. Codeia is very near to morphia in its effects, but presents no particular point of advantage over it. Its application need only be tried in those occasional cases in which morphia or narceia has failed. Morphia is much more useful than narceia, and there is no difficulty of application. Its operation is more striking than that of the other alkaloids of opium, but is by no means purely narcotic, and some of its peculiarities are undesirable in a therapeutic point of view. If if fails to narcotise, as it pretty often does, the effect is by no means a negative one, for there are often stomach and other symptoms of an uncomfortable kind. Another mischief is, that when we come to the very high doses the line is uncommonly fine between what is and what is not poisonous.

Narceia has no contra indications, and may be given in cases where morphia cannot be used, and, indeed, is the one special remedy for such a case. It is especially given for checking vomiting and controlling the circulation. In any instance where both morphia and narceia may be equally given, the latter is always to be preferred. It is a special hypnotic, and the sleep which it brings is most closely like that of health. It has the great recommendation that an over-dose does little harm. The doses may be pushed as high as a grain and a half or two grains in bad cases with advantage. Its action in producing sleep is more sure than that of morphia. It should thus be applied, in the first instance, in all cases where it is required to produce sleep.

Indian hemp has been tried by Reissner in many cases. He employs a 6 per cent. solution of the extract in strong rectified spirit. He has never found the slightest effect. Even in a case where he employed about eleven grains of the extract, in several injections, in the course of two hours there was only a slight irregularity of the pulse, and a fractional elevation of temperature. There was always a local swelling produced, which lasted some time, but quietly disappeared. Although the results are so far unsatisfactory, the author thinks that the hypodermic use of Indian hemp has a future before it.

Finally, the author has tried various purgatives, namely, croton oil, colocynth, and elaterium, by subcutaneous injection. He comes, however, to the conclusion that as yet a manageable purgative, capable of hypodermic administration, has to be found. It is, of course, highly

desirable, in view of the difficulties which often attend the administration of medicines by the mouth to the insane, that the number of possible hypodermic remedies should be as greatly as possible extended. ('Zeitsch. f. Psychiatrie,' 1867.)

Delirium.

Dr. Handfield Jones relates ('St. George's Hospital Reports,' 1869) eight cases to illustrate delirium. In the first it was mainly the result of mental anxiety, and a few doses of half a grain of tartar emetic, with some morphia and henbane, subdued it. The second was a case of mania transitoria, which passed off in a few days. The third was hysteric delirium, which was quieted by inhaling chloroform. The fourth was apoplectic. The fifth slight delirium in a debilitated subject, after nose-bleeding. The sixth was a case of a stout man, physically overworked, and having undergone mental shock some years before, from which he had never recovered. Strychnine, nitric acid, and valerian and other tonics, quickly cured him. Cases 7 and 8 were fatal; the former a complication of fever and tuberculosis, the latter with convulsions.

Jones remarks that delirium and convulsions are allied conditions; in both there is undue excitability and mobility. They may be taken as a type of irritation, which condition has the following features:—The part affected is unduly impressionable, is less of its natural stimuli than in health; its functional energy is lowered; it is less capable of doing its appointed work, but is much more readily set in action. At the same time its nutritive actions are deranged; its secretions, if it be a secreting organ, are often increased or morbidly changed; while its vessels, participating in the general enfeeblement, no longer duly regulate the blood-supply, or restrain their contents from exuding in excessive quantities.

Dr. A. W. Barclay reports three cases of delirium, apparently depending on anæmia of the brain. The first was a case of acute rheumatism, in a female, æt. 21, in whom slight signs of pericarditis had been noticed on the eleventh day, but had then passed off, and the course had been entirely favorable during the next three or four days, except that a slight delirium had come on. On the nineteenth day she was affected with so much tremor as to give rise to the suspicion of delirium tremens; but inquiry proved that she was quite a temperate person. In spite of opium the delirium became violent, the face wore a dusky hue, and the breathing was much oppressed. She sank into a state of coma and rapidly died. On dissection the brain and membranes were found healthy, except that they were rather drier than usual. There were congestion of the lungs and slight signs of pleurisy and pericarditis, and also of peritonitis. The spleen was soft and flabby, the uterus highly vascular internally, purulent fluid flowing from the os. The knee-joints were found affected with intense fibrinogenic inflammation.

The second case was that of a man, æt. 30, with slight rheumatic fever; he was of drunken habits, and had been accustomed to get violent when in liquor. On the tenth day his manner became peculiar; he took an aversion to the man in the next bed to him, and looked

sullen and angry. His diet was immediately improved, and four ounces of brandy ordered. He became extremely violent in the course of the day; in spite of brandy and morphia, got no sleep, and was talking, shouting, and singing. There were none of the ordinary symptoms of delirium tremens. This state continued for several days without his getting more than short snatches of sleep. The violence then began to abate, and he gained more sleep. His fury was somewhat replaced by sulkiness. The rheumatic symptoms never gave any further trouble, but the mental symptoms yielded slowly, and at the end of five weeks, when dismissed from the hospital, he was still in a disturbed and unhealthy state of mind.

The third case was that of a woman, who believed herself to have swallowed poison, and was, consequently, very much alarmed and excited. There was the mark of a blow on her forehead, of which she gave no account. She had vomited after having taken the supposed poison, and this was repeated several times, with a good deal of retching and straining. Next day she seemed to be going on well, but towards night she broke out into noisy delirium. Morphia subcutaneously injected failed to obtain sleep. The following night, too, she got no rest; she was very talkative and excited, with some delusions, but with no tremor. Whether in consequence of repeated opiates or not, she got some sleep on the third night, and from that time gradually improved. About three weeks from the commencement of the illness she was discharged cured.

Barclay supposes that in all these cases the occurrence of delirium was largely due to the want of food. He thinks that, in this kind of cases opiates are only of secondary importance to improved nourishment and stimulants. He thinks the absence of tremor in the last two cases, while it was present in the first, may be explained by the fact that in the latter there was much greater nervous exhaustion, the nervous system not being merely *starved*, as in the other cases also, but *poisoned* by the rheumatic process. He thinks that tremor, indeed, is a symptom of altered blood in acute diseases ('St. George's Hospital Reports,' 1868).

Interstitial Encephalitis.

Virchow writes a paper on this subject. He refers to the researches detailed before the Association of Scientific Men at Hanover, and reported in the thirty-eighth volume of the 'Archiv,' on a peculiar form of congenital encephalitis and myelitis, and the subsequent observation of Gräfe on the connection between these changes and the ulceration of the cornea, and the confirmation of this by Hirschberg.

As the inquiries have proceeded, it has become plain that not merely infants, but also children of some months old, suffer the same changes; and it is plain that, though in many cases the process begins before birth, in many others it occurs some time after birth. It is possible that the mortality in the first months of life may depend on this cause. Hayem, in consequence of Virchow's researches, has examined the brains of all young infants who have died under his care, and has been surprised to find the frequency of these changes. So far he has only observed a

dozen cases, and these only in infants less than a month old. It is not to be supposed that the alteration is found in all infants dying at this age. There is no doubt that in many cases no such changes are present.

Isolated nucleated cells, or scattered fatty changes in the vessels, are naturally found. It is specially to be noticed that there are fatty changes frequently in the sheaths and walls of the vessels which have no necessary relation with encephalitis. The characteristic sign of the latter affection is that the change takes place in the cells of the neuroglia, and even in the white substance; and although the vessels, whether capillaries or larger ones, sometimes participate in the change, this is by no means necessary. On the contrary, the vessels may be altogether healthy.

The condition of the vessels in encephalitis may be very various. Not to speak of the fatty degeneration of the walls already mentioned, there is the greatest variety in their contents. In some cases (though these are rare) the vessels are empty. In others even the smallest are filled. In others the vessels are unequally dilated. The latter condition generally goes along with extreme fatty changes. The altered condition of the neuroglia is so easy to be recognised with the microscope that the state of the vessels need not be investigated in order to decide the diagnosis. It is otherwise, however, in settling the nature of the process. Hayem raises the question whether all cases of fatty changes of the cells of the neuroglia must be considered inflammatory. He says that we may well assume this in all cases of this nature in which there is great vascularity and dirty grey or yellow colour without softening, but with exudation and nucleated cells in various points; but other cases are not necessarily so. Virchow does not agree with this opinion. Neither formation of new vessels nor hyperæmic injection is necessary. The latter is a variable element, which may disappear after death, although it was present up to the fatal moment. Of course it is of importance when we find it on dissection, but its absence proves nothing. Much more important are the local adventitious changes which Virchow dwelt upon in his former treatises. These, however, are only found at the most diseased points. Around them are discovered the regularly diffused changes, which in some cases are the only alterations present. There can be no doubt that the yellowish and greyish points are the result of inflammation. It is necessary here to mention a peculiar form of softening which sometimes occurs. The spots of this kind of softening contain peculiar spindle-shaped bodies, which consist of altered axis-cylinders. They may be easily mistaken for connective-tissue-corpuscles. It is difficult to recognise them as parts of a broken-up axis-cylinder, unless they are very carefully examined, when it will be found that they contain nerve-fibres surrounded with myeline. The nerve-tube often looks varicose.

It is obvious that the above-described process resembles much the changes in the retina in albuminous nephritis. In the latter also we have fatty changes of the interstitial cells, and that varicose enlargement of the axis-cylinder which Müller first described. ('Virchow's Archiv,' iv, 4, 1868.)

Aphasia.

A great number of papers have been written on this subject of late years. In the 'Biennial Retrospect' for 1865-6, we summed up the opinions of Dr. J. H. Jackson, as the chief representative of knowledge on this subject in England, and gave references to the principal papers published here and in other countries. Looking back at the years 1867-8, the following are the principal points which we have to mention in connection with this subject.

A growing tendency is observed to throw overboard the idea, at first mainly prevalent, that the faculty of speech would be found to be located in some one distinct portion of the brain. The first papers of Bouillaud evidently pointed to a phrenological view, based more or less on those of Gall and Spurzheim. Later came the anatomical researches of Dax and Broca, who showed the frequent concurrence of right-sided hemiplegia and left-sided disease of the brain with the affection in question. It is to Dr. J. H. Jackson that the credit chiefly belongs of pointing out the insufficiency of this view. In various papers in the 'Lancet' (Feb. 7, 1866, Dec. 1867, and July 25, 1868), he insisted, first, that language was a very much more complicated faculty than had been supposed; and, secondly, that if a very large number of fatal cases of aphasia showed lesion about the neighbourhood of the third frontal convolution, that was as much as to say that a large proportion of those cases had lesions in the immediate surroundings of the corpora striata, *i. e.* in the most important centre and meeting-place of the various fibres of the brain. A similar view was argued at the British Association Meeting at Norwich, in 1868, by Dr. Hughes Bennett. Dr. Jackson has added most important observations on the different degrees with which the intellectual and the emotional kinds of speech are affected. He has shown that the man who cannot by any possibility find the right phrase for a merely indifferent object will swear with vigour and precision. He has shown, too, that aphasia is by no means so rigorously separated off from other varieties of cerebral disease affecting the intellect on one side, and muscular movements on the other, as had been carelessly supposed by some.

There remain, however, a curious series of facts to be explained, in which probably lies the further elucidation of the whole question, although that elucidation will probably be of a nature precisely opposite to that which at first sight they seem to indicate. First of all, there is no denying the general fact of the great preponderance of left-sided brain lesion in well-marked aphasia. Secondly, it must be admitted that the third frontal convolution is involved, if it be not the only part affected, in a great majority of cases. In seeking for an explanation of these very curious facts it is necessary to take notice of some special statements and theories that have been put forward.

First, there is the statement of Gratiolet, that the left frontal convolutions are always developed more quickly and completely than the right—a theory which would be exceedingly interesting if true, but which Carl Vogt, no mean authority in such matters, expressly con-

tradicted and repudiated at Norwich. Then there is the fact, which Vogt himself mentioned at Norwich, and which is, we presume, undisputed, that in *apes* the third left convolution actually is entirely absent.

Of theories which go to explain the predominance of left-sided action in speech, there is none more remarkable than that which was independently arrived at by Prof. Broca in 1865 and by Dr. Moxon in 1866. This theory ascribes the lead taken by the left cerebral hemisphere, and especially its frontal convolutions, in those mental acts which make appropriate speech and writing possible, to the constant education of the left side of the brain by the traditional habit which decides that we shall perform a variety of daily and common acts (employing, however, great skill and delicacy of movement) with our right limbs. If the theory of Gratiolet were true (which, however, is disputed), this centripetal influence would be reinforced by the natural disposition of the left convolutions to develop with more rapidity than the right. (The foregoing is from an article in the 'Lancet,' Sept. 19, 1868, by the author of the present Report.)

Dr. Maudsley objects altogether to Broca's and every other theory which localises the faculty of speech in particular convolutions of the brain. He says that from the stand-point at which we have arrived it is impossible to admit the existence of a speech faculty in the convolutions without supposing that they were the seat of motor centres, and thus abandoning all that we know definitely concerning the functions of different parts of the brain. He does not propound any hypothesis as to where are the motor centres of speech—whether in the corpora striata, or corpora olivaria, or somewhere else. He only asserts the conviction that, like all of the motor centres, they must be subordinate to the supreme hemispherical ganglia. Broca's theory is inadmissible *à priori*, as well as inconclusive *à posteriori*. It agrees neither with what we know of the physiology of language nor with the pathological evidence on which it professes to rest. It is easy to conceive different pathological conditions to account for the phenomena of aphasia, more probable physiologically than Broca's hypothesis, and more in conformity with the morbid lesions actually found in aphasia, for the facts really point, not to lesion of the third left frontal convolution as the essential element, but to lesion of some part of the corpora striata, or of some motor nuclei or intercommunicating fibres in its neighbourhood —to lesion, anyhow, of some part of the motor centres or of their communications with the supreme centres. We shall bear in mind that if the actual motor centres of speech be not implicated in the destruction of tissue, they may still be paralysed by the inhibitory influence of a severe damage in their near neighbourhood.

Of Dr. Moxon's theory, Maudsley remarks that the education of the motor nuclei of one side must be the education of the other side if they always acted simultaneously, an objection which Moxon appears to have overlooked. There is, moreover, no warrant for the assumption postulated by the theory of a one-sided speech faculty, that a motor nucleus on one side, independently of its fellow, govern the movements of both sides of the body. If the supposed analogy of writing be urged at all, we ought to push it further, and ask how it is that an intelligent

aphasic does not learn to speak with the right brain. How is it that he does not succeed in such a comparatively simple task, especially as it appears that he actually can sometimes express his thoughts in writing? Maudsley thinks that the action of the two halves of the brain in speech should be compared to that of the two eyes in vision. You may destroy the sight of one eye by destroying the external orbit, and the other will remain perfect; but if you destroyed the optic ganglia upon one side you would probably abolish the sight of both eyes.

The difficulty still remains as to the cause of the frequent association of aphasia with right hemiplegia. Is it not possible that the usual limitation of the power of writing to the left side of the brain may, after all, have something to do with it? The motor centres of speech and the motor centres of writing are evidently in close functional connection. Now, if these different motor centres sympathise so intimately in healthy action, it is presumable that they will sympathise in disease. An injury of the motor nuclei of writing may, though not directly implicating the motor nuclei of speech, still abolish the functions of the latter by sympathetic or inhibitory action. Whether this be so or not, it is possible to suppose some anatomical differences either in the brain structure or in the disposition of the blood-vessels, which might account for the frequent coincidence of aphasia with right hemiplegia, without the necessity of supposing a location of the faculty of speech in one side of the brain. There must be some such difference to account for right hemiplegia being more common than left hemiplegia ('Lancet,' i, 1868, pp. 690 and 721).

Dr. Bateman, of Norwich, writes a series of papers ('Journal of Mental Science' for 1868) which are not yet concluded, in which he, in the first place, sums up most elaborately all that has been done upon this subject by English and foreign observers. He then proceeds to notice certain cases observed by himself. These present various forms of the affection—from the pure and uncomplicated abolition or suspension of speech without paralysis, or any other symptoms, to the partial or even occasional impediment of that faculty, a plan which is safer than that of taking merely typical cases. In his first case the sequence of morbid affections is curious. The first symptom was total loss of speech. After partial recovery of that faculty verbal amnesia was observed, loss of the memory of words limited to substantives, then epileptiform convulsions, and, alternating with each other, hemiplegia and paraplegia. Eventually this change of symptoms merged into general paralysis. The loss of speech was at first of the atactic form, though there may have been also some verbal amnesia. For some days the total loss of speech was the only symptom. When the amnesia was added it consisted in loss of memory of words, and we may ask whether the early simple ataxia of speech was a forgetfulness of the *movements* necessary for speech. Bateman believes the early loss of speech was due to a momentary cerebral congestion in the same locality which afterwards gave rise to the more permanent symptoms. He believes that the disease was limited to the convolutional grey matter, as there was never any persistent paralysis referable to lesion of the

central ganglia. Bateman remarks that the opinion of writers is divided on the question, whether intelligence is, as a rule, affected in aphasia. Trousseau held the opinion that the mental faculties were always more or less impaired; but Professor Lordet's was an instance of the occurrence of aphasia, whilst the highest intellectual power was retained. Bateman's case was quite similar during its early stage. Bateman's next case is one of amnesic aphasia, with right hemiplegia, in which the posterior part of the left hemisphere was found softened after death. The anterior lobes were healthy. The defect of speech was here confined to a confusion in the choice of words to express his thoughts. He died after an apoplectiform seizure. The case somewhat corresponds to one related by Abercrombie. The next case is one of right, and subsequently left hemiplegia, with loss of speech for a time. After death the sole lesion was the presence of a clot in the central part of each hemisphere, evidently embarrassing the motor centres. The case next related is one of aphasia with right hemiplegia, where after death nothing was found amiss with the anterior lobes, but there was some disease of bone at the centre of the fossa corresponding to the middle lobe of the brain on the left side. The case was doubtless syphilitic. An interesting fact is that the patient's brother had right hemiplegia with dysphagia. This and the two former cases are direct negative instances against Broca's theory, and form a very powerful objection to it. The next illustration is a case of paraplegia and spinal symptoms with loss of speech, but never any permanent paralysis that could be referred to the brain. Another case recorded by Bateman is one of atactic aphasia occurring as a climacteric symptom. No amount of prompting would assist this patient in the least. Her difficulty was solely one of muscular ordination. It is curious that in this case the lesion of speech first occurred after severe sore throat, which may possibly have been diphtheritic. Bateman regards it as possible that the symptoms might be due to uræmia in some form. In fact, there was partial suppression of urine pretty frequently. Bateman's next case is one of left hemiplegia with aphasia. No disease was found in the frontal convolutions, but there was extensive disease in the right hemispheres, vegetations on the aortic and mitral valves, and fibrous clots in the spleen. The cardiac disease was doubtless the primary cause of the softening of the cerebral tissue, and it is likely that vegetations like those found on the valves after death had been carried into one or more of the cerebral vessels. Bateman remarks on this case, that left hemiplegia, with loss of speech, is, he believes, much more common than is generally supposed. Dr. Crichton Brown has collected six cases of this sort. All the symptoms are in direct antagonism to the theories both of Dax and Broca. Although the series of papers is not concluded within our period, it is apparent that Dr. Bateman is inclined to reject all the theories as yet propounded as insufficient to account for the production of aphasia.

Dr. Alexander Robertson, of Glasgow, relates three cases of aphasia, upon which he bases some general remarks on the theory of the disease. It is his opinion that in aphasia there is a lesion usually in the left hemisphere of the brain of efferent fibres passing between the convolu-

tions and the great co-ordinating centres, probably at some point of the line extending from the external frontal convolutions to the corpus striatum, so that voluntary motor impulses for the articulation of language cannot be transmitted. The essential morbid change is therefore motor, and not mental. However, there is in most cases an accompanying degeneration of the powers of the mind, which varies in degree in different persons, but in the majority distinctly involves the general faculty of memory. The condition of the intellect does not differ from that which is associated with non-aphasic hemiplegia, but it would seem that the emotional powers are less frequently disturbed. It follows that there is no necessity for supposing the existence of an organ for language, as a defect in transmission, along with general weakening of the mental faculties, is competent to account for the various phenomena hitherto observed in the sufferers from aphasia.

At present there is no sufficient explanation of the almost constant occurrence of the lesion in the left side of the brain. Theories have been advanced which either involve the belief in a departure from the general plan of nature, the duality of our "organs of relation," or suppose, what seems inconsistent with the wisdom of Divine arrangement, that organs have been created which never discharge the special functions with which they were endowed. It is suggested that it would be well in the first instance to establish beyond doubt that the absence of aphasia in morbid states of the right hemisphere is not to be accounted for by the escape of parts usually implicated on the left side, owing to some slight anatomical difference, such as is known to exist between other bilateral organs. Failing this hypothesis, let us search anew for some more satisfactory solution of the difficulty than has yet been proposed ('Journal of Mental Science,' January, 1867).

Loss of Smell from Local Etherisation.

A case is recorded ('Virchow's Archiv,' iv, 41, 1867) in which the continual inspiration of the fumes of ether, accidentally in the course of some experiments on animals, caused a gradual failure of the sense of smell, and at last its total aberration. There appears no doubt that the effect was due to the continuous contact of sulphuric ether with the minute branches of the olfactory nerve.

Tubercular Meningitis.

Dr. S. J. Gee, in a very remarkable article upon this disease ('Reynolds's System of Medicine,' vol. ii), makes some observations which ought to be carefully weighed, as the words of a physician who has had a very large experience with regard to his subject. "Tubercular meningitis has been known to end in recovery. It is necessary to state this as a matter of science, but in practice it unhappily comes to this, that a person suffering from tubercular meningitis will inevitably die. . . . . The prognosis is only too easy; reckon twenty-one days from the invasion symptoms, and, in the majority of cases, that will cover the fatal termination. What, then, is to be done by way of prevention of the disease? The prophylactics and ordinary hygienics

are the same—animal food, change of air, warmth to the surface, and moderate exercise; to which may be added cod-liver oil and cinchona. The sad prognosis of tubercular meningitis does not attach itself to acute tuberculosis. No doubt many persons recover from acute tuberculosis; knowing this, any patient suffering from what is possibly acute tubercle should be treated very carefully, so as, if possible, to stop the disease and prevent the brain being involved. Nor should the physician give way to the fatalism which follows upon being sure of the existence of hydrocephalus, until he is quite certain of his diagnosis. As much liquid food as possible should be given to the patient, by means of a syringe placed between his teeth, if need be. There is no doubt that leeches, active purging, blistering, ulcerating, and such like measures, hasten the advance of death. It is best not to shave the head unless there be a distinct indication. If the corneæ begin to ulcerate it is as well to keep the eyelids closed by means of a little sticking-plaster."

Dr. C. Mettenheimer, of Schwerin, reviews the subject of the employment of opium in acute tubercular meningitis, and we mention the case because the author's experience seems, though he is unconscious of it, really to confirm the melancholy estimate of the power of medicine in this disease which most recent writers have formed. Dr. Mettenheimer follows the directions of West, who says that, although the question of the administration of opium in acute basilar meningitis is a difficult one, this remedy may probably be given with advantage after the heat of the head and the rapidity of pulse have been diminished by leeching and purgation. Following these indications, Dr. Mettenheimer gave to a child, one year old, who had been in constantly recurring convulsions for three days, 1-24th of a grain of morphia, with the apparent result that the convulsions ceased. But seven days later they returned, and, although the morphia was repeated, death occurred three days afterwards. This seems to be precisely a case of those remissions which Dr. Gee (in the article above quoted) and Rilliet describe, and which are so deceptive in acute tubecular meningitis, by leading to a too sanguine prognosis ('Der praktische Arzt,' März, 1868).

Abscess of the Brain.

Drs. Gull and Sutton, in an elaborate paper on this disease ('Reynolds's System of Medicine,' vol. ii), based on a tabular statement of 76 cases, give the following analysis of the symptoms:—There was pain in the head in 39 cases; epilepsy from seizures in 38; coma in 30; heaviness, stupor, and drowsiness in 30; paralysis in 24; rigors in 17; pyrexia in 13; delirium in 18; vomiting in 12; incontinence of urine, or of fæces, or both, in 15; vertigo in 8; disordered sensibility, not including the pain in the head, in 6; defective articulation in 4; defective sight in 3; an apoplectic attack in 1. The most frequent symptoms, therefore, are pain in the head, epileptiform attacks, paralysis, coma, heaviness, drowsiness, stupor, rigors, pyrexia, delirium, vomiting, and incontinency of urine and fæces. The authors dwell upon emaciation setting in rapidly as a marked symptom in several of their cases—similar emaciation

as seen in some cases of tumour of the brain, but is not so frequent as in abscesses. They maintain that pyæmic abscess of the brain is particularly likely to mislead, in consequence of the frequent absence in these cases of any different symptoms pointing to the brain. With regard to the question whether abscess in brain can ever be spontaneously cured, the authors expressed themselves with caution. The practical facts are, of course, against the idea of curability; nevertheless, the development of firm cyst-walls in some cases shows the disposition to spontaneous cure. It is usual to find the pus in such abscesses very degenerate, namely, granular and fatty; this would favour its absorption and other changes which in other abscesses would be recognised as pointing to a cure.

Dr. Meyer, of Zurich, in the treatment of this affection, established the following points of diagnosis between brain abscess and other affections:—(1) From hydrocephalus. The diagnosis is only possible where the history of the case is known; for instance, where there is evidence of a previous inflammation and of the remission of the symptoms, and where the mind has remained untroubled. In cases where abscess of the brain is only seen in the last stage it is impossible to distinguish it from hydrocephalus. (2) From embolism and apoplexy. In the last stage of the abscess, where it bursts into the ventricle itself, diagnosis from apoplexy may be impossible. The best test is the height of the accompanying fever, as also the gradual occurrence of paralysis, and its origin from small brain territories, as also the occurrence of convulsions. (3) From acute red softening, which, indeed, is the first stage of the abscess. The etiological circumstances are of the most importance here; the occurrence of remissions, and the height of the fever. (4) From chronic softening. The relatively early age in abscess, the rare existence of disease of the vessels, pain in the head, and the absence of mental derangement, the rarity of contraction of the limbs, and the typical course of the disease, distinguish it from chronic softening. (5) From brain tumour. Chronic abscess so closely resembles brain tumour that its diagnosis from the latter is excessively difficult. The known causes are the most important matter, as also the peculiarity of the course and the special symptoms. The special symptoms of abscess are the following:—The pain in the head is slighter and more equable, less neuralgic, and less free from complications, in abscess than in tumour. Mental derangements are much rarer in abscess, as also alterations of sensibility without motor derangement. General and local convulsions may occur equally in either affection. Persistent disturbance of the mind speaks strongly against abscess, whilst remarkable and remitting fever is much in its favour. In tumour there is no perceptible initial stage. Its subsequent course is more even, and without the typic character of chronic abscess. As regards the diagnosis of the seat of abscess, it is to be remembered that this is usually an indifferent one, and therefore gives no characteristic symptoms. The known causes may teach us something. For instance, if it be the result of a wound, abscess is generally found in the neighbourhood of the latter, as in the case of chronic otitis. Where affections of the nose are the cause the abscess will be found in the middle lobe of the brain, or the

posterior part of the anterior lobe. Of single symptoms, the weightiest is the position of the pain, where this is defined, and the occurrence of limited convulsions and paralysis. Headache, especially when occipital, ordinarily corresponds with the seat of the abscess in the brain. Affections of the motor ganglia almost always cause symptoms on the opposite side. When the abscess is in the cerebellum there are often no characteristic symptoms. As regards the size of the abscess, it may be remarked that the nearer its focus is to the motor centres or the grey cortical substances the more numerous the symptoms will be. There are no means of diagnosing whether one or more abscesses are present; but with regard to secondary abscess of the brain, the author records eight cases, of which four were secondary to affections of the lungs, one to otorrhœa, and three to external injuries of the joints ('Zur Pathol. des Hirnabscesses,' R. Meyer, Zurich, 1867).

Professor Béhier confirms the pathological discovery of Charcot and Bouchard of the universal existence of small aneurisms of the cerebral arteries in cases where cerebral hæmorrhage takes place. These are not like the aneurisms which occur upon a large trunk; they are changes in the little vessels which commence with a sclerosis of the general arterial system of the brain. Small, true, aneurismal, bladder-like dilatations make their appearance, sometimes only bulging out on one side, more frequently fusiform enlargements. To the naked eye, as seen on the surface or in the substance of the brain, they appear as red or blackish objects hardly the size of a millet seed. They are found in the centre of the hæmorrhagic effusion itself, and communicate with it by an opening which in all respects resembles the rupture of a common aneurism. Around the rupture one finds the remnants of the membrana adventitia. Occasionally the effusion is at first between the artery and the surrounding adventitia, but finally bursts the latter. In fact, we see in these cases how the coagula in these little aneurisms continue into the blood-clots which form the hæmorrhagic effusion. Since Béhier's attention has been directed to the subject he has never failed to find these little aneurisms in every case of cerebral hæmorrhage, and he recognises them as the most important element in the causation of hæmorrhagic apoplexy ('Gazette des Hôpitaux,' 20, 1868).

Chorea.

Dr. John Harley comes to some important conclusions as to the value of conium in the treatment of this disease.

(1) For a long time we have been using preparations of hemlock, which are completely inert even when given in the largest doses that can be conveniently taken.

(2) That the extract and succus of the present pharmacopœia are also inert when given in the doses therein prescribed.

(3) That in order to influence any of the diseases to which it is antagonistic, hemlock must be given in such doses as will produce within about an hour its proper physiological effects.

(4) That the quantity required to produce these effects will bear a direct proportion to the muscular activity of the individual. He regards chorea simply as a primary disorder of nervous centres, and, excluding

all other remedies, has relied on hemlock alone. He has found it useful to give such large doses as from three drachms to half an ounce or five drachms daily, and sometimes even twice or three times a day. The production of the proper physiological effect is indicated by the occurrence of giddiness, tottering, and great heaviness, with tendency to sleep, or rather to cease muscular exertion and remain quiescent; this condition rapidly passes off. The medicine seems to have no effect on the pulse or pupils nor upon any of the secretions; in short, these enormous doses appear usually to have the effect of influencing the disease of the nervous centres which is the cause of chorea. As before observed, the amount which will be required is proportionate to the muscular activity of the patient.

Dr. J. W. Ogle sums up the history of sixteen cases of fatal chorea occurring at St. George's Hospital between 1841 and 1867. Fourteen were females and two males. The ages were, in two cases, 7 and 9; in three, 21, 23, 26; in the remaining eleven between 10 and 20 years; the duration of the disease was in one case eight days, in three cases ten days, in one case fourteen days, in two cases three days, in one case six days, in one case nine weeks, in two cases three months, in one case six months, and in one case seven months. Three of the patients had suffered from chorea before. Of concurrent diseases epilepsy, delirium, and scarlet fever occurred each in one case; headache, hysteria, mania, and erysipelas each in two cases; in five cases there was disturbance of menstruation; in two pregnancy. The existing causes were, in eight cases, mental, mostly fright. Rheumatic affections had occurred in four, if not six, cases previously. As regards anatomical changes there was greater or less hyperemia of the brain or softening, or both; in six cases softening of special portions of the brain. In ten cases there were fibrinous deposits on the heart-valves, and in three of these also pericarditis. Notwithstanding these facts, Ogle opposes the opinions of Kirkes and Tuckwell that there is always heart disease and embolism in chorea, and explains their frequent concurrence by a rheumatic anæmic condition, which is the common cause of all the symptoms.

Epilepsy.

Dr. A. Flint, of America, discusses the various remedies for this disease. He speaks of nitrate of silver, zinc, digitalis, opium, belladonna, and bromide of potassium; he speaks more strongly than most recent writers of the value of nitrate of silver. On the subject of oxide of zinc he does not add anything to the statements of Herpin; he mentions Bevington's use of sulphate of zinc and Barnsey's employment of the phosphate without expressing an opinion; he speaks well of the valerianate. Of copper, with or without ammonia, he also speaks on the authority of others. The preparation of digitalis which he recommended is the infusion in increasing doses to as high a point as can be tolerated, and given for long periods. He discourages the use of opium; he repeats Trousseau's opinions about belladonna without expressing a definite opinion. Of bromide of potassium he speaks strongly with personal knowledge. Both in his own experience and

that of his colleague, Professor Barber, it has proved most effective. He gives it in 30-grain doses three times a day for a long time together.

Professor Griesinger describes a series of symptoms of an epileptoid character on the whole, but which are of a doubtful nature and origin. There are many attacks of vertigo found in people in later life. The following are the points of distinction from cases depending on congestion or anatomical changes:—there are attacks of giddiness in childhood and early youth which are sometimes rudimentary indeed, and in that case may be excluded from this class. The giddiness is described as a sensation starting from the chest, the stomach, and especially from one of the extremities. Consciousness is much disturbed. There are also convulsive moving of the lips, or convulsive swallowing, or the patient murmurs a few words, or has sensations of numbness in a part of the body, or finds his strength suddenly vanish. The epileptoid character is most marked in the case of slight and very frequent attacks, not followed by other and more serious affections, especially if they frequently occur at night. It is of consequence to inquire about hereditary disease, the previous occurrence of wounds, and to search for the scars of these. Wherever these attacks exist we may any day expect a fully developed epileptic paroxysm to break out. There is a group of cases which people either overlook altogether or consider to be hypochondriacal or hysterical. They are distinguished from ordinary epilepsy by the remarkable predominance of symptoms in the intervals, and the very slight and incomplete attacks. The majority of patients are young, about twenty years old. The symptoms between the fits are almost limited to the sensitive and psychical organs, and constitute an extremely tormenting influence, which occasionally even upsets the mind. There may be every variety of disturbed sensibility, hallucinations, and in men very frequently motility is disturbed in the form of slight twitchings; there are also disturbances of the vaso-motor and secretory nerves. Whilst these symptoms of a severe general functional disturbance, though varying in particular cases, agree in their permanence on the whole, there are particular attacks which from their obscurity are to be particularly studied. These are especially attacks of giddiness of the character described above, or traumatic cases, or the occurrence of sudden anguish or confusion of mind. In cases where there is suspicion of the epileptoid nature of the attacks it must especially be inquired what are the symptoms, and especially the intermediate symptoms. There is no sound basis of morbid anatomy, nor can a complete diagnosis be established, but among the group of symptoms we may recognise pathological individualities. The treatment of these cases must be especially constitutional, nevertheless certain empiric remedies cannot be omitted. The bromide of potassium has been used by Griesinger, especially in cases of the second group, and in large doses, with strikingly favorable effect ('Arch. f. Psychiat u. Nrvenkr,' p. 230, 1868).

Neuritis.

Dr. Fayrer, of the Medical College Hospital, Calcutta, records the case of a native gentleman, æt. 30, who had suffered severely for three

months from pain in the left hip, which had confined him to bed. Three months before, he had been salivated for a venereal affection, and almost directly afterwards the pain began. During this period he had had several attacks of irritative fever, and was much reduced; the pain was so severe and constant as to prevent sleep. Blisters had been appliéd over the seat of pain, and many drugs, including iodide of potassium, used without benefit. There were none of the usual signs of hip-joint disease, but there was great pain in the sciatic nerve in the gluteal region, especially at one point, where there seemed to be deep-seated fluctuation, with fulness and induration in the course of the nerve. There was also tenderness on deep pressure in the iliac region. Inflammation and effusion at the sheath of the nerve were suspected. He had not previously been unhealthy, nor subject to sciatica or rheumatism. Fayrer made a puncture with a long narrow knife down to the induration; more than half an ounce of clear serum escaped. Immediate and almost perfect relief followed, and in a couple of days the man left Calcutta for his home. Fayrer says that this is the only case of the kind he has met with, but he should in future look with care for similar signs of effusion in the sheath of the nerve where there is sciatica. The affection may have been due either to the venereal disease or to the mercury which he took for it; but as there was no evidence of constitutional syphilis, and as iodide of potassium had no effect, he thinks that the case was one of pure inflammation ('Med. Times and Gaz.,' Jan. 4, 1868).

Neurotic Atrophy of the Face.

Dr. Bärwinkel relates a case of this rare affection. Atrophy was altogether limited to parts supplied by the infra-orbital nerve. In this region both the skin, the muscle, the fat, the bones, and even the teeth, were equally affected. No trace of loss of sensibility in the diseased nerves could be found. It could not, therefore, be supposed that the trunk of the infra-orbital nerve itself was diseased. There is only one organ which is in union with it alone, and not with the other two branches, namely, the spheno-palatine ganglion. Peripheral affection, which some authors assign as a cause of neurotic atrophy, really offers no explanation of such a case, for it does not account for the peculiar diffusion of the affection in the face, nor for the immunity of sensibility and motion. Romberg and Samuel attribute the atrophy in these cases to injury to trophic nerves. Other authors think the affection is one of vaso-motor nerves. It is not easy to explain the limitation of the disease on the theory that it depends on vascular changes, because, in that case, some parts which ought to be affected escape.

The assumption of atrophy from active contraction of the vessels is not merely contradicted by the impossibility of such a spasm being kept up long enough, but by the fact that faradic irritation of the skin produces redness. We seem limited to the theory of trophic nerve disease, which produces this affection, and cases like the above seem to show that these nerves originate in peculiar centres, namely, the ganglia of the sensory nerves. What the nature of the ganglion disease may be is, of course, impossible to be determined in the absence of dis-

sections. We can only judge, from the history of most of the cases, that the spheno-palatine ganglion is the seat of the disease in such a case as the above. In other cases the Gasserian ganglion is probably affected. It is likely enough that disease of the sphenoidal cells is at the bottom of the mischief in some cases ('Arch. der Heilk.,' 1867).

Neuralgia.

Dr. Anstie, in a treatise on neuralgia ('Reynolds's System of Medicine,' ii, 68), speaks thus of the pathology of the disease. He observes that there is no sufficient evidence to establish an anatomical basis for an accurate pathology of the disease. At the same time, it is remarkable that the most complete case, as regards post-mortem examination, that has ever been recorded, viz. a case of neuralgia of the fifth, of the most intractable kind, related by Romberg, afforded an example of the severest possible nerve pain coexisting with a state of *atrophy* of the nerve, so complete that its tissues were almost destroyed. It is imaginable that a not less real, but less advanced and obvious atrophic change, may be present in every case of neuralgia, even where dissection has failed to reveal anything amiss. The following is the theory to which the author inclines. He thinks it most probable that in all cases of neuralgia there is either atrophy or a tendency to it in the posterior root of the painful nerve, or in the central grey matter with which it comes in closest connection. The following are the heads of the argument:

1. Neuralgia is eminently hereditary. It is constantly observed to prevail in particular families breaking out in successive generations and various individuals. It is even more important to notice that these neuralgic families are nearly always distinguished by a tendency to the severer neuroses—insanity, cerebral softening, paralysis, epilepsy, hypochondriasis, or an incontrollable tendency to alcoholic excesses; and very often, in the various members of the same family, all these affections, and also neuralgia, alternate.

2. Such hereditary tendencies in a race suggest a tendency to imperfection in the congenital construction of the central nervous system, so that we may imagine that certain cells and fibres of this system are, in a large proportion of that race, built only to live with perfect life for a short time. The weak spot may be in one place in this person, in another place in that.

3. Given such a weak spot congenitally present, all hostile influences will tell more heavily on it than on the rest of the organs. The depressing influence of cold applied to the surface, or a wound of trunk or branches of a nerve, or a severe shock, mental or physical, to the nervous centres generally, or of continued alcoholic excesses, may suffice to throw the imperfectly constructed cells into a state of positive disease which may end in decided atrophy. Even in the absence of any special external cause the depressing influence on the nervous centres produced by the great crises of puberty, child-bearing, and the involution of the female organs at the grand climacteric, and still more the partial failure

of nutrition which the arterial degeneration of advanced life would cause—any of these may suffice to start the local morbid process.

4. A very weighty argument in favour of the idea that central mischief is a factor in all cases of neuralgia is the great frequency of complications such as the author describes, in which various nerve-fibres, quite distinct from those which are the seat of pain, and connected with these only through the centre, are secondarily affected.

5. Those cases in which a localised peripheral lesion is the immediate excitant also require for their explanation the assumption of a peculiarity in the individual as one factor, and that the most important, in the production of the neuralgia. Of hundreds of people to whom exactly similar lesions happened every year, not more than two or three, perhaps, experience any neuralgia, and these will be found, the author believes, to belong to neurotic families.

6. The only cases to which the theory of congenital central imperfection appears neither applicable nor necessary are those in which an ulceration, sore, or other lesion, extending from neighbouring tissues towards the nerve, maintains a constant depressing centripetal influence, which it is not difficult to suppose might impair the vitality of the posterior root or of the central grey matter.

7. Certain influences, especially that of excessive drinking, which notoriously tend to produce degeneration of the nervous centres, are powerful predisposers to neuralgia of the inveterate type. Moreover, the descendants of drunkards, among other evidences of an enfeebled nervous organization, are exceedingly prone to neuralgia.

The treatment of neuralgia is considered under three heads—constitutional stimulant narcotic, and local. Of constitutional remedies the author gives, farther, the highest place to nutritive tonics, especially to fatty foods and to cod-liver oil, as the most easily assimilated animal fat. Quinine he believes to have a very limited range of action outside the sphere of true malarial neuralgias. Iron he thinks only useful in anæmic cases. In regard to the supposed connection of neuralgia with gout, the author thinks that the frequency of this is probably exaggerated, and that at any rate in practice specific remedies like colchicum are not often very useful. On the other hand, rheumatism is the undoubted source of a certain number of cases, the affection here probably consisting of an inflammation of the nerve-sheath and of the surrounding tissues; iodide of potassium is here of real service. The same may be said of a limited class of cases in which syphilitic deposits press on the nerve and so cause pain. Of narcotic stimulant remedies the author places morphia and atropia far at the head in regard to all superficial neuralgias, and strongly prefers their administration in minute doses subcutaneously. For certain visceral neuralgias, as angina pectoris and ovarian neuralgia, ether in drachm doses is much the best immediate anodyne. As to tonic remedies tending to keep off the attack of the latter neuralgias, the author speaks most strongly of arsenic. In a later paper ('Practitioner,' July, 1868) he announces that apparent powerful results are produced in the same disease by the subcutaneous use of strychnine in minute doses. He recommends the

same remedy, and also caffeine injected in grain doses, as powerful remedies for gastralgia.

Of local remedies the author prefers blistering to every other. He recommends that, whatever the apparent site of the pain, the blister should be placed as near as possible to the place of issue of the posterior branches of the affected nerve from the spinal canal.

Dr. Ramskill records a most interesting case of the dreadful affection named "epileptiform neuralgia" by Trousseau, which was complicated with severe and frequently repeated general epileptiform convulsions. The patient was a married woman, æt. 30, the mother of three children, and the immediate cause of the attack seemed to be intense grief. The neuralgia was in the branches of the ophthalmic division of the fifth nerve, and was of extreme violence, never entirely leaving her, by night or day. A tender point was developed at the top of the head; the least touch on this brought on a violent paroxysm. After trying successively, and in vain, a full course of iodide of potassium, and then bromide of potassium in scruple doses for a fortnight, Ramskill thought of the treatment by large and increasing doses of opium recommended by Trousseau. He commenced with half a grain of morphia three times a day, and after a few days increased it to three quarters of a grain, and then to one grain, thrice daily. From the third day of this treatment the pain abated, and after a week the patient became able to eat solid food; the convulsive seizures became less frequent, and at the date of the report had ceased altogether for ten days. At this time she was taking one grain of morphia four times a day, and it was Dr. Ramskill's intention to push it in increasing doses, in proportion as she became accustomed to it. He confesses, however, that, like Trousseau, he believes this remedy to be a mere palliative, and that the malady would return ('British Med. Journal,' Jan. 5, 1867).

Gastralgia.

Dr. A. Leared ('Brit. Med. Journal,' Nov. 23 and 30, 1867) recommends arsenic in the treatment of this complaint. The disease is characterised by great pain and feeling of faintness, probably dependent on affection of the solar plexus. The pains are paroxysmal, and occurring at first with long, but afterwards at shorter, intervals; they occur when the stomach is empty. The malady attacks without warning, and in full health, but gradually produces nervous exhaustion; all but the slightest attacks are accompanied with vomiting. When the pain is severe there is a considerable amount of collapse; stimuli or food sometimes give relief, sometimes increase the pain. The author tried prussic acid, bismuth, and preparations of manganese, &c.; but at last used arsenic, with remarkably good results. He gave five drops of Fowler's solution in the course of the day. Arsenic must not be used where the stomach is painful after food, except only in certain cases of phthisis, with gastralgia; in pyrosis, where this does not depend on anæmia; in sub-acute gastritis, in ulcer of the stomach, in chronic congestion of the stomach, and congestion consequent on heart disease, and in cancer of the stomach. It is important to notice before beginning the treatment whether the pain is increased or diminished by

eating. Where the pain is not dependent on the causes above mentioned, and where it is aggravated by fasting, arsenic, as a rule, relieves it. If the patient lives in an aguish neighbourhood, or if he has already suffered from ague, or from neuralgia of the face, &c., arsenic is strongly indicated. On the other hand, if the papillæ of the tongue are prominent and red, the epigastrium sensitive to pressure, the skin hot and dry, and the pulse rapid, arsenic does more harm than good.

Electricity in the Treatment of Neuralgia.

Dr. Benedikt gives a very decided opinion as to the superiority of the constant current over faradization in the treatment of the majority of cases of neuralgia. The whole class of neuralgiæ which depend upon central causes, and especially a group which he believes to be very numerous and important, in which the affection originates in the posterior nerve-roots, faradization is not merely useless, but hurtful. The apparatus for the continuous current which he recommends is a modification of the Daniell's battery, by Siemens-Halske. With regard to neuralgia of the fifth, he makes the most important statements as to the good effects of galvanizing the sympathetic nerve with a current from ten or twelve cells at the most. This is an operation which must be most carefully performed. The sittings ought not to be more than half a minute's duration at any time, as the most serious accidents may be produced unless these rules are carefully observed. He relates some astonishing instances of cure of the worst forms of facial tic by this method. In spinal neuralgia the zinc pole should be placed on any vertebra which may happen to be tender, so as to make the current come out through it. Where the nerve-roots are supposed to be affected the positive pole is fixed upon the vertebra opposite the highest nerve origin that can be concerned, and the zinc pole is stroked down by the side of the spine processes some forty times in succession. This is most effective treatment, and rarely fails to cure in a very short time. Benedikt is particular in stating that pain ought never to be produced in a case of genuine neuralgia. A current so intense as to produce this effect does harm ('Elektro-therapie,' Dr. M. Benedikt, Vienna, 1868).

Inflammatory Affections of the Spinal Cord.

Dr. Hitzig relates a case of disease of the spinal cord which presented the symptoms of a secondary tabes dorsalis, and which was probably a case of traumatic meningitis. The patient had been ten months ill when he came under his care. There was now great muscular weakness and general emaciation, probably produced by want of appetite; exalted sensibility of the skin to irritation everywhere except in the face. The limbs and trunks were subject to reflex movements on excitement. Pressure on the muscles was very painful, also on the vertebræ, and especially in the intervertebral spaces. The sense of space was extraordinarily diminished. The treatment consisted in the use of the "stabile" downward galvanic current to the cord. After eight séances the spontaneous pains were removed, and mobility was improved. After six weeks' treatment all the nervous symptoms were removed.

An attempt at the use of the "labile" current had done harm. In the final treatment Dr. Hitzig applied galvanization of the great nerve trunks. The patient got a relapse nine months after his first cure, in consequence of immoderate excitement. The same treatment as before improved him at first, but the symptoms again got worse. Besides his old complaint there were spasms in the lower extremities and one half of the body, and highly exalted sensibility of the skin; trembling in the hands, especially the one of the opposite side, increased by voluntary movements. Involuntary movements soon afterwards came on, accompanying every voluntary muscular action. However, all this passed off again. The patient was finally left with somewhat diminished muscular activity, but able to do his work. He had some uncertainty of the right hand and some pains in the back, with changes of the temperature. The sense of touch and locality were but little changed at all. The author believes that the original cause was meningitis, followed by subsequent changes in the nutrition of the cord. He did not feel justified, notwithstanding some symptoms, in treating it for tabes, because the paralysis was of a very high degree at first, and the pains in the back were very prominent. The eccentric pains in tabes are never persistent. The pains were never spread over the whole body, but usually very limited. Besides this, the constant current, like every other remedy, is useless in tabes ('Virchow's Archiv,' xl, 3 and 4, 1867).

Progressive Muscular Atrophy.

Dr. C. Hilton Fagge makes a contribution to the electrical treatment of this disease. During two years he has had under his care ten cases, all of which have been mainly and most solely treated by the continuous current from the Daniell's battery. The positive pole was applied to the back of the head or neck, the negative pole over the spine, not higher than the fifth cervical vertebra. The current is allowed to pass for a quarter of an hour at a time, and was used daily. The method is Remak's, and Dr. Fagge verifies the occasional occurrence of the so-called diplegic contractions of the paralysed parts. The first case, that of a man aged 27, which was comparatively recent, yielded very quickly to the treatment; in three months he was quite well. The second case, which was of two years' standing, was not at all benefited. The third case was also not very decidedly improved. A fourth case was an extreme one, and no remedies were at all useful: the man died. In a fifth case, that of a woman aged 32, no very clear results were produced. It seems a little doubtful that the disease was genuine progressive muscular atrophy, as there were spasmodic symptoms of a very unusual kind. The continuous current was applied daily for a long time, and ultimately the patient recovered almost entirely. It must be remarked, however, that quinine had been simultaneously used. Three cases were treated by induced currents. It seems very doubtful whether one of them, which was greatly benefited by faradisation, was not a case of lead paralysis. The next case was that of a man, aged 47, who had had the disease for seven months. The muscles of the shoulders were very much wasted and affected with twitchings. Faradisation was ordered every other day, and the patient

also took small doses of quinine and nux vomica. There was no very decided benefit. The third case was that of a woman, aged 24, in whom a most extraordinary degree of wasting of nearly all the voluntary muscles had occurred. The faradisation was regularly ordered; but as she had previously taken iodide of potassium for three weeks, and as there was great suspicion of lead poisoning, the case is inconclusive; nevertheless, it seems certain that faradisation had much to do with the recovery, which Dr. Wilks pronounced to be one of the most remarkable he had ever seen. In two other cases both the continuous and the induced currents were employed. The patient was a woman, aged 36. The upper limbs were strongly affected, especially on the right side. Their contractility with the continuous current was much reduced, as was sensibility to the same current. In about six weeks after the daily use of the continuous current a very marked improvement had taken place, not only in the power of the affected muscles, but also in their sensibility to the current. When this was left off for a few days the patient complained of languor. For the last three weeks the right or more feeble limb had been daily faradised, and in a month's time all the muscles of each hand, except those of the thumbs, reacted to the current. The final improvement was only partial, and the patient went into the country improved, but by no means cured. A second case, which was treated with both currents for a long period, gave no particular results ('Practitioner,' Dec. 1868).

One-sided Spinal Paralysis.

Rosenthal reports two cases observed by himself. The first patient was 27 years old, and he caught a cold when much heated. He soon experienced an exaltation of sensibility, first in the right foot and then of the left, which passed on into an anæsthesia. Two months afterwards, amid symptoms of excitement, a paralysis of the right arm and leg occurred. Six months from the commencement there existed an anæsthesia and analgesia extending from the right collar-bone and shoulder-blade downwards over the whole half of the body with the exception of the coccygeal nerve. At the same time the sense of temperature was destroyed on the right side, but the reflex movements were partially exalted. The anæsthestic parts were frequently subject to a weary feeling and with a kind of burning. Motility was not affected at all. On the left side, on the contrary, sensibility was normal, but all voluntary movements were put an end to. Reflex movement and sensitiveness to temperature were exalted, contractility of muscles to the fenadic current was considerably diminished, and the excitability of the radial nerve to the galvanic current was also diminished. Rosenthal believed that this was inflammation of the left half of the spinal cord, caused by cold, and treated it first with iodide of potash and cool baths, afterwards with the exciting galvanic current applied to the spine and to the nerve-trunks, alternating with faradisation of the skin over the anæsthetic parts. In seven weeks motility was restored, but sensibility was not improved. After three months' treatment both motility and sensibility were perfect. The second case was one of a wound with a knife on the left side of the spinal processes of the third and fourth and fifth dorsal

vertebræ, and a blow on the right side of the loins. Paralysis of the left leg and insensibility of the right leg immediately set in. The left arm was also numb. Three months later an almost total paralysis of the left leg and paresis of the left arm occurred. Sensibility was everywhere normal on the left side. Iridic contractility and galvanic excitability notably diminished. The right leg retained its movements and its sense of touch. On the other hand, the feeling of pain and temperature and electric stimuli was altogether lost, as also the muscular sensibility, but the muscular sense was intact. The analgesia extended itself upwards to the angles of the ribs. The affection was seated, in Rosenthal's opinion, in the lumbar enlargement of the cord. Two months' use of faradisation of the muscles cured the paralysis of the left side, but the analgesia remained, in spite of the most intense electrical excitement, unchanged. Rosenthal remarks on the agreement of his observations with those of Brown-Séquard. They establish the direct crossing of the sensitive nerves at their entrance into the cord. The crossing of the motor nerves is evidently much higher, probably in the pyramids. The course of the nerve-fibres conveys muscular sense towards the motor nerves and the different qualities of the sensory nerves and their different points of emergence from the cord. The degree of the extension of the paralysis depends on the seat of the disease. The condition of the paralysed parts as regards electricity is peculiar to true spinal paralysis. The prognosis depends on the place of the lesion ('Oesterr. Ztschr. f. prakt. Heilk,' xiii, 47, 49, 50, and 52 to 67).

Hysterical Paralysis.

Dr. Levenstein reports three cases of this affection in which the lower extremities were particularly affected with cramps, alteration of nutrition, whilst there were aphonia, exalted sensibility of the retina, &c., which had lasted a long time. On the theory that the sense of hysteria is the absence of will, he attempted to influence the patients by mental compulsion. He made the patients persistently attempt those movements which they could not perform, and keep them up methodically till they learned to do them perfectly. He assisted the treatment by the use of tonics and cold water. The three other cases were respectively cured in seven, two, and three months. However, symptoms for some time returned, and one of the patients had a melancholic attack.

Quinine in Periodical Nervous Diseases.

Dr. Berthollet reports four cases of indefinite nerve pain, recurring periodically, and cured by quinine. The first was that of a young lady who, in the first place, suffered from a continuous fever with sleeplessness, and pain in the lower part of the stomach. After this there were two attacks every day of fever and a comatose condition. Quinine at first produced no effect; the tendency to fever increased and became continuous. Quinine was now tried a second time, and a single dose of seven and a half grains produced a permanent cure. The second case was one of hysterical paroxysms, which for three months had come on in a young woman every evening and lasted for four hours. About

eight grains of quinine were given and quieted the disorder at once. A third case was one in which for several days there had been severe attacks of nervous tremors. A dose of eight grains of quinine cured. In the fourth case an attack of cephalalgia had occurred every week for the last ten years. A single dose of eight grains of quinine taken shortly before an expected attack produced permanent cure ('L'Union Méd.,' 123, 1867).

Tetanus.

Dr. H. F. Andrews, of Washington, Georgia, relates a case in which a negro had his hands and wrists crushed in a thrashing-machine, which were amputated in consequence. He did well for more than three weeks, when he was attacked with severe tetanus. The stumps had united perfectly, except at the point where the ligatures passed out. Dr Andrews tried to pull the ligatures out, but failed. Thirty grains of bromide of potassium were prescribed at once, and twenty grains ordered to be given every twenty-four hours. The relief was speedy; there were no spasms during the following night, and the patient slept several hours. The paroxysms returned next morning, but not so violently. The ligatures could not be removed till two days later. The improvement was steady and progressive, and in a week the patient was substantially free from the tetanus. Dr. Andrews thinks that the ligatures remaining so long were probably the exciting cause of the disease, and that they were probably not drawn sufficiently tight at the time of the operation ('American Journal,' October, 1868).

Tetanic Convulsions in a Young Child.

Dr. J. W. Vogel relates a very interesting case of this sort. The child was strong and of good appearance, and came of a very healthy family. It had fourteen teeth, it made no complaint, but had somewhat lost appetite. A powder was obtained from the druggist, the nature of which cannot be ascertained; the child slept fast that night, and at nine o'clock the next morning again fell into convulsions, and was at last conveyed into the hospital. The convulsions were especially on the right side of the body, and were there more tetanic than the rest. The child was put into a hot bath in vain. It was remarked that the convulsive action principally affected one half of the body. The face muscles were strongly contracted together, the eyelids were wide apart and the pupils were dilated on both sides. The skin was somewhat hotter than ordinarily, the face was bluish, the respiration slow and accompanied with snoring. Castor oil was ordered, and calomel subsequently. There was a question of scarifying the gums, but no one happened to have a knife about him. Dr. Vogel came to the opinion that a bladder full of ice applied on the vertebræ might do good. On this plan several little bladders filled with ice were bound together and applied with success. The whole or greater part of the spinal column should be covered with these little bags of ice ('Journ. f. Kinderkr.,' 48, 1867).

Pathology of the Sympathetic.

Drs. Eulenburg and Guttmann have summed up the amount of our existing positive knowledge as to the pathology of the sympathetic. They treat—(1) of the traumatic lesions of the cervical sympathetic; (2) of hemicrania; and (3) of Basedow's (Graves's) disease. (1) Traumatic lesions consist of compression by tumours and shot wounds of the sympathetic in the neck. The phenomena produced by compressing tumours in the neck are usually paralytic, and consist in contraction of the pupil and congestion of the vessels with increased sweating. Occasionally a tumour acts irritatively, and then the pupil is dilated. Usually the condition of the pupil is more conspicuous than the vaso-motor symptoms. Shot wounds of the sympathetic often occurred in the American war. Ten weeks after an injury there existed great narrowing of the pupil, especially when the eye was closed. Slight ptosis, slight hanging of the outer corner of the upper lid, diminution of the size of the globe, injection of the conjunctiva, flow of tears, myopia and reddening of the face on that side during exertion. (2) Hemicrania of late years is explained as a neurosis of the sympathetic, chiefly by Du Bois-Reymond, who studied it in his own person, and established the fact that the symptoms all arose from spasm of the muscular coats of the arteries. He placed the seat of the pain in the muscular walls of the vessels in which, through the double operation of contraction and of dilatation by the contents, the sensory muscular nerves are irritated, each pulsation increasing the pain. The authors of the present summary propound another theory. They attribute the pain to anæmia of the affected half of the head, producing irritation of the sensory nerves, either of the brain itself or of those of the membrane, or of the pericranium, or of the external skin. Bornetwuk, resting upon the theory of Du Bois-Reymond, has tried to explain the successful operation of caffein, quinine, &c., in attacks of migraine, inasmuch as these remedies remove the atony of the vascular walls which follows the spasm. Möllendorff has lately expressed the opinion that in hemicrania there is either a typic or an atypic active congestion of the brain, produced by weakness of the vaso-motor nerves. He says nothing of a primary spasm of the latter. The foundation of his opinion is extremely weighty in the opinion of our authors, and it would thus appear that hemicrania may depend upon two opposite conditions, anæmia and hyperæmia. The remarkable slowing of the pulse mentioned by Möllendorff depends on direct irritation of the medulla oblongata and the vagi. The former is the centre of most vaso-motor nerves; one comes to understand that its irritation can produce narrowing of the radial artery in the attacks and secondary lowering of temperature at the periphery of the body. The remaining phenomena of hemicrania can easily be explained by paralysis of the vessels. Both opinions as to the nature of hemicrania point to a local treatment, and that through the cranial vaso-motor nerves. The best remedy is galvanization of the sympathetic, which is shown by the experience both of Benedict and of Eulenburg and Guttmann to be extremely effective, especially in palliating the pain ('Arch. f. Psych. und Nervenkr.,' p. 421, 1868; 'Schmidt's Jahrb.,' 139, p. 290.)

Other papers on nervous diseases are—

Adams, W., progressive paralysis with hypertrophy of muscles ('Lancet,' 1867, ii, p. 579). Althaus, faradisation for constipation ('Lancet,' 1867, ii). Beddoe, cannabis indica in delirium tremens ('Med. Press and Circ.,' Oct. 16, 1867). Benedikt, chorea minor and its electrical treatment ('Oest. Ztsch. f. prakt. Heilk,' 34, 36, 1867). Berthier, ptyalism in the insane ('Journ. de Méd. Ment.,' v, 5, 6). Bernhardt, vaso-motor epilepsy ('Berl. Klin. Woch.,' 10, 11, 1868). Betz, bilateral neuralgia ('Memorab.,' 5, 1867; 'Prag. Vierteljahrsch.,' 2, 1868). Bacon, G. M., modes of death in epilepsy ('Lancet,' 1868, i, p. 555). Bacon, G. M., cases of epilepsy terminating in sudden death ('Lancet,' 1868, ii, p. 41). Bärwinkel, a series of papers on the value of electrotherapy ('Archiv d. Heilkunde,' 1868). Beigel, pathology and treatment of epilepsy ('Lancet,' 1868, ii, pp. 793, 825). Benedikt, electrotherapy (Vienna, 8vo, 1868—a most excellent and exhaustive work). Broca, epileptic fits stopped by compression of radial and median nerves ('Bull. de l'Acad.,' 1868). Campbell, A., traumatic tetanus successfully treated with Calabar bean ('Lancet,' 1867, ii, p. 157). Holmes Coote, tetanus, idiopathic ('Lancet,' 1867, ii, p. 767). Colin, interstitial cerebral apoplexy ('Gaz. des Hôp.,' 104, 1867). Cyon, tabes dorsalis (Berlin, 1867). Clouston, tuberculosis in the insane ('Journ. Ment. Science,' 1867). Dumesnil and Lailler, effects of opium and digitalis, combined, in excitability of certain mental diseases ('Ann. Méd. Psych.,' Jan., 1868). Dumontpellier, cure of obstinate hiccough by faradisation ('Union Méd.,' 150, 1867). Eulenberg, observations on the pathological and therapeutical relations of galvanism to paralysis ('Berl. Klin. Woch.,' 1, 2, 1868). Empleken, jun., pathology of acute myelitis ('Prag. Vierteljahrsch.,' 3, 1866). Franque, mental affections in hysterical patients ('Corresp. f. Psych.,' 10, 1867). Friedberg, contusion of the brain ('Corresp. f. Psych.,' 7, 8, 1868). Garrod, doubtful case of nerve lesion ('Lancet,' ii, 1867). Harrison, traumatic tetanus cured by nicotine ('Lancet,' 1867, ii, p. 577). Hagen, theory of hallucinations ('Allg. Ztsch. f. Psych.,' 1, 2, 1868). Hayem, case of acute ascending paralysis ('Gaz. des Hôp.,' 102, 1867). Herard, glosso-pharyngeal paralysis ('Union Méd.,' 35, 1868). Handfield Jones, hypochondriasis cured by strychnia ('Lancet,' 1867, i, p. 726); convulsion and spasm cured by faradisation, &c. ('Lancet,' 1867, i, p. 4). Kocher, case of trichinous paralysis ('Berl. Klin. Woch.,' 10, 11, 1868). Jackson, Hughlings, regional palsy and spasm ('Lancet,' 1867, i, pp. 205, 295). Lépine, variations of temperature in paralysed limbs ('Gaz. Med.,' 35, 1868). Laurent, acute delirium from ascaris lumbricoides in œsophagus ('Ann. Méd. Psych., Sept.,' 1867). Loewenhardt, remarkable case of compression of cerebellum ('Berl. Klin. Woch.,' 39, 40, 1867). Luys, cases of cerebellar disease diagnosed during life ('Gaz. des Hôp.,' 105, 1867). Lockhart Clarke and G. Harley, case of acute progressive paralysis, with post-mortem ('Lancet,' 1868, ii, p. 451). Magni, paralysis of abducens oculi from dilatation of an arterial twig ('Rev. Clin.,' 3, p. 82, 1868). Mettenheimer, effects of narcotics in basilar meningitis ('Memorab.,' 5, 1867; 'Prag. Vierteljahrsch.,' 2, 1868). Meyer, R., abscess of brain (inaug. diss., Zurich., 1867). Meyer, E., section of ciliary nerves in sympathetic ophthalmia ('Ann. d'Oculist.,' Sept. and Oct., 1867). Meyer, application of electricity to medicine (8vo, Berlin, 3rd edit., much enlarged, 1868). Macnamara, temporary amaurosis in the course of paralysis of lower extremities ('Med. Times and Gaz.,' May 2, 1868). Murchison, case of progressive paralysis of four extremities ('Lancet,' 1867, ii, p. 579). Nothnagel, origin of convulsions from the pons and from the medulla oblongata ('Virchow's Arch.,' 1, 1868). Ordenstein, paralysis agitans, sclerosis *en plaques generalisés* (Paris, 1868, pp. 86). Paget, G. E., gastric epilepsy ('Lancet,' 1868, i, pp. 459, 491). Panes, partial anæsthesia of infra-orbital nerve ('Gaz. des Hôp.,' 19, 1868). Pierreson, diplegia facialis ('Arch. Gén.,' Août., Sept., 1867). Pana, tetanus cured by large doses of opium ('Ann. Méd. Psych.,' 1867). Paralysis of insane, rapidly developed ('Lancet,' 1868, i, p. 283). Radcliffe, C. B., good effects of treatment in epilepsy from congenital syphilis ('Lancet,' 1868, ii, p. 634). Reynolds, J. R., a most important paper on paralysis with wasting of muscles, especially in children; this article will not bear compression, but must be read at length ('Lancet,' 1868, ii, p. 35). Robertson, A., partial convulsions in abscess of brain ('Med. Times and Gaz.,' June 15, 1867). Schüppel, glioma and gliomyxoma of spinal cord (Wagner's 'Arch. f. Heilk.,' 2, 1867). Surmay, chronic alcoholism ('Union Méd.,' 19, 21, 1868). Schivardi, melancholia cured by electricity ('Gaz. Lomb.,' 4, 1867). Stone, Domett, case of

paralytic insanity cured ('Lancet,' 1867, ii, p. 146). Thierfelder, sen., prevention of epilepsy and mental diseases ('Prag. Vierteljahrsch.,' 1, 1868). Taylor, cure of vesical palsy, after labour, by faradisation ('Lancet,' 1868, i, p. 314). Tabes dorsalis cured (partly) by constant current ('Wien. Med. Wochensch.,' 35, 1868). Trophic inflammation of eye from palsy of facial nerve ('Deutsch. Klin.,' 25, 1867). Eben Watson, tetanus cured by Calabar bean ('Lancet,' 1868, i, p. 434). Vanzetti, successful section of lingual nerve for neuralgia of tongue ('Gaz. des Hôp.,' 8, 1867).

C. RESPIRATORY DISEASES.

Tubercular Affections of the Larynx.

Dr. Otto Prinz, of Dresden, writes on this subject. He remarks that laryngoscopic examination gives a direct contradiction to the common belief that the local deposition of tubercle is the first step to the formation of laryngeal ulcers in tuberculosis. It is shown, on the contrary, that the successive stages are catarrh, infiltration of a spot, and then ulceration; or else ulceration directly follows on catarrh. The evidence is in favour of the inflammatory origin of tubercular ulcers. In nearly all tuberculous subjects there is visible hyperæmia of the larynx, if nothing more. Tuberculous inflammations of the larynx differ in nothing from simple catarrhal affections except in being never acute, but always subacute or chronic. Tuberculous catarrh of the larynx often remains in the merely catarrhal stage down to the date of death; but in other cases it goes through various stages of change, the next one being *parenchymatous infiltration*. When this attacks the epiglottis that organ appears thickened and red in its whole extent, or else at its edges; there is difficulty of swallowing, from the sense of dryness and of something sticking in the throat. If the arytæroid cartilages are thickened and red the patients complain of the same thing, and also experience pain when pressure is applied between the sterno-mastoid and the posterior border of the thyroid cartilage. When the meso-arytænoid folds are infiltrated, and appear as wart-like swellings between the arytænoid cartilages, the voice is usually thick and hoarse, although the vocal cords may be sound. Infiltration of the false cords is usually one-sided, oftener right than left. The corresponding true cord is covered with soft swelling, generally red, but sometimes normal in colour. Infiltration of the true cords, usually accompanied by ulceration, is distinguished from mere catarrh by the thickening of the cords, by their uneven granular aspect, and by their difficult movements in opening and shutting the glottis. *Partial chronic œdema* of the larynx is found either around ulcers or in the mucous membrane covering inflamed, carious, or necrosed cartilage. *Tubercular perichondritis* may affect all the cartilages, but chiefly attacks the arytænoids; it leads to greater or less destruction of the voice. In the epiglottis it produces swelling of that organ to three or four lines' thickness, and complete change of shape; it generally interrupts the view of the larynx. In both of these affections there is often dysphagia. Perichondritis of the cricoid and of the thyroid occasionally produces emphysema of the skin and abscess. It is a great mistake to suppose, as many do, that tubercular ulcers of the larynx only occur in the later stages of tuberculosis.

On the contrary, they are frequently developed at a very early period, and, indeed, before any other signs of tuberculosis are noticeable. It is only the so-called "zonular" ulcers (*Gürtel-geschwüre*) which never appear till the final stages. It is impossible to tell whether an ulcer is catarrhal, tuberculous, or syphilitic; the only distinctive mark, if any, is the obstinacy of the tuberculous ulcers, though they do sometimes heal. Ulcers of the epiglottis are usually superficial; when they are deeper the cartilage is soon destroyed. Little ulcers on the posterior aspect of the epiglottis give no pain unless there is much infiltration; but there may be much dysphagia; indeed, if the destruction of the epiglottis be extensive, or the ulcers also attack the arytæno-epiglottidean folds and the pharynx, or extend from the true or the false cords to the posterior wall of the larynx, swallowing may become impossible. Ulcers of the vocal cords are either mere erosions, or go deeper and destroy muscle and cartilage; they are either on one side (mostly the right) or on both, in which case they are usually connected with each other. The edges of the ulcers often appear toothed and fringed. If the ulcer is superficial it often gives the impression of an indurated chancre. Hoarseness and aphonia are the consequences; but if the ulcers be not too large, and be shallow and defined at the edge, the voice is not altogether spoiled. The patients complain but little of pain.

Many laryngoscopists believe in the curability of laryngeal tubercular affections, and especially ulcers; but they are usually of long duration, and relapses are apt to occur ('Archiv d. Heilkunde,' 5, 1868).

Croup.

Dr. A. Jacobi has performed tracheotomy for croup on 67 children, with 13 recoveries; but in 5 instances the operation had no fair chance, as the patients were either dead or moribund at the time, so that the proportion ought to be taken as 13 recovering in 62. Of children under 3 years, 1 out of 5 operated on recovered; of those between 3 and 4, 3 out of 16; of those between 4 and 5, 7 out of 23; of those between 5 and 6, 2 out of 7. The after treatment in some of the successful cases was protracted; in 4 of these the causes of the protraction were peculiar. In the second week after operation the larynx, having expelled the false membrane, would resume its natural functions, and the patient breathed normally through the tube and its upper fenestra and the larynx, the anterior opening of the tube having been corked. But the removal of the tube always caused suffocation, so that it had to be replaced. The cause of this annoying state of things was found to be the presence of small polypoid excrescences, originating on the margin of the tracheal wound—in one case on the lower portion of the sore larynx itself. It required a great many applications of nitrate of silver, or some sulphate of iron, to destroy them. Their disappearance instantly relieved the symptoms, and allowed of the final removal of the tube.

In the 'American Journal' for Oct. 1868, which contains the above, there is also noticed a paper of Prof. Steiner's, which sums up the experience of that high authority on the same subject.

Steiner had 52 operations on children (33 boys, and 19 girls), and 18 recoveries; 11 of the latter were boys, and 7 girls. The operation is more successful when not too long postponed. The subsequent treatment is all important; and thus in the hospitals, where the greatest care is taken, better results are got than in private practice. Besides the ordinary directions as to light but nutritious food, beer, &c., Steiner recommends the following medicinal treatment. If there be free mucous secretion and expectoration, ipecacuanha, either alone or with the extract of bark, should be given. When there is much fever, infusion of digitalis and nitre, or a few drops of tinct. opii, with cold fomentations to the chest. When there is constant dyspnœa, arnica, ammonia, anise, and benzoin; when collapse ensues, wine, camphor, and musk. If there be faucial croup, chlorate of potash gargle must be used, or in quite young children, the throat should be washed with solution of nitrate of silver. The tubes must be properly and constantly cleaned. A continued irritative cough often results from ulceration of the tracheal mucous membrane, produced by an accretion upon the portion of the canula within the trachea. When infiltration takes place, followed by loss of substance at the edges of the wound in the windpipe, pieces of charpie, wet with solution of chlorate of potash, 5 to 6 grains to the ounce, must be applied. When gangrene is threatened, chlorate of potash, quinine, acids, and wine must be used.

Drs. H. W. Stork and H. G. Hopelink relate a case of spontaneous croup in the adult. A woman, æt. 29, half way through her pregnancy, had suffered for four weeks from hoarseness; this was treated as ordinary laryngitis, and nothing remarkable occurred for some days till one night severe dyspnœa occurred, forcing the patient to sit upright; inspiration was shrill, but not rapid, and a deep breath could be taken. There was no clang with the voice, but there was pain and a sensation as if something was stuck in the throat. In the back of the pharynx nothing was to be seen except slight redness and mucous secretion; percussion gave a normal sound, auscultation showed mucous râles. The cough occasionally came on very hoarsely, and with such severity that one thought the patient must be suffocated. There was much grey mucous expectoration; pulse 128. The patient felt grea fatigue. It appeared that the patient had, twenty-four hours previously, during an attack of coughing, spat out a piece of membrane the size of the bowl of a tablespoon. Afterwards two smaller pieces were ejected, but the patient felt no relief. Calomel and yellow sulphuret of antimony were prescribed and blisters applied to the neck. Next morning the condition was the same; pulse 126. In a fit of coughing at night another piece of membrane was ejected. In the afternoon the patient seemed to be dying; she was really very much collapsed, with her face swollen, though not livid; it was decided to open the windpipe, but this was ultimately put aside, and liver of sulphur given instead. At 6 p.m. the patient was far quieter and the breathing less rapid. At 10 o'clock the patient slept; pulse 120. Another smal piece of membrane was expectorated; besides the chest sounds previously heard, there was now a "bruit de drapeau." At 3 o'clock next day the condition was tolerable, but there was then greater shortness

of breath, the cough was more barking; mucus and small pieces of membrane were ejected. Suddenly the distress of breathing became much more severe, and a piece of membrane 15 inches long and with branches corresponding to the bronchi was ejected. The patient was now very much exhausted; pulse 140; cough dry and without clang, breathing freer. At 2 p.m. two more pieces of membrane were ejected, the cough was looser, and the breathing noiseless. In the evening the patient slept from time to time, the cough was loose, and the breathing easy and 40 per minute; pulse, 140; great apathy. Next day the patient slept several times, only waking to expectorate now and then. Finally, the cough departed and the patient was practically restored to health ('Schmidt's Jahrb.,' 138, p. 313).

Dr. Hermann Beigel writes strongly as to the value of inhalation of atomised fluids in croup. He recommends, from *personal* experience, bromide of potassium and lime-water; the former of these was employed with marked success by Schnitzler; the latter was strongly recommended by Dr. Geiger, of Philadelphia, Professor Biermer, and many others. The solution of bromide employed is 10 grains to the ounce of water; the lime-water is used 1 part to 30 of water; this is said to have a powerful effect in dissolving the false membranes. Another remedy capable of being used in the form of spray is *tannin*, employed by Barthez and Trousseau with great success in causing ejection of false membrane. Watery vapour has been employed in croup by Macintosh and Budd; and oxygen was given, by inhalation, by Miguel in the case of an infant of 21 months with remarkable success. Beigel thinks that in all cases of croup it will be advisable in the first place to apply the medicated sprays, these being very easily obtained, and the apparatus being always in readiness. (Beigel recommends and figures a simple modification of Bergmann's apparatus, with a long vulcanite terminal tube.) As regards the order of merit of the atomisable remedies for croup, he places lime-water first, tannin second, and bromide of potassium third ('Practitioner,' August, 1868).

Treatment of Catarrh of the Larynx.

Dr. Gerhardt writes upon this subject. In those cases which are often attributed to cold, but are really as frequently produced by a continuous hot and dry temperature, and are accompanied with tumefaction of the lining of the larynx, the inhalation of almost any liquid, such, for instance, as a very weak solution of salt, will often cure. If the tumefaction is great, tannin or alum solution will be better. In the more acute forms, accompanied with hoarseness, pain, and irritation, and sometimes with difficulty of breathing, with abundant secretion, as in drunkards, tubercular subjects, scrofulous and syphilitic patients, we must use insufflation of astringent powders, such as alum or sulphate of copper, or the local application of a spray of nitrate of silver. In the catarrh which comes from fatigue of the voice, the baths of Ems, Selters, and Soden are very useful. The muscular weakness which is so common is treated by solution of caustic ammonia, taken in sugared water. In catarrh depending upon an old bronchitis turpentine inhalations are the best. Where the irritation is due to

inflammation of the larynx, Gerhardt regards the narcotics, such as henbane, belladonna, &c., as necessary besides the local treatment. Gerhardt mentions chlorate of potass as a very useful remedy in catarrh of the larynx. He has known it succeed in syphilitic cases where mercury has failed to arrest ulceration. He thinks, indeed, that mercury often causes a laryngeal affection which chlorate of potash is necessary to remove ('Journ. Méd. de Bruxelles').

Professor Steiner, of Prague, discusses the so-called "dry catarrh" of the air-passages of children. This disease is sufficiently common in adults, and has already been well described by Laennec; but it also appears in childhood, and arises spontaneously in the continuations of the larger into the smaller bronchial tubes; emphysema, usually, soon occurs. In the cases observed by the author there was no sign of hooping-cough, neither did dissection reveal any other affection but the changes of dry catarrh. In two cases there were found at the posterior and dependent parts of the lungs islands of collapsed tissue; at the edges, and here and there on the surface, emphysematous patches. The bronchial mucous membrane, from the bifurcation to the bronchioles, was hyperæmic and much swollen, but without secretion. The lymph-glands were hyperplastic, dark red, and in some cases caseously transformed; in the brain passive hyperæmia and slight serous effusions were observed; there was general anæmia. The symptoms and cause of the disease were as follows:—Difficult breathing, with special exertion in expiration, respirations 40—48. Restlessness, as in laryngeal croup, impossibility of lying down. The breathing, both during sleep and also in condition of prostration, was accompanied by a hoarse and noisy expiration sound. Frequent repeated irritative cough, with violent attacks of coughing, differing from those of pertussis in lacking the spasmodic inspiration, the rattling of mucus, and the vomiting, which are typical of the latter. Cough dry and shrill, without râles and without sputa, even after the disease had lasted weeks or months. Percussion gave everywhere a clear, full, more or less tympanitic sound; on auscultation hoarse vesicular breathing and dry rhonchus were heard. Usually there was little fever; the temperature was often below that of health, but the pulse was quickened, 130 to 140. Emaciation and anæmia occurred in the later stages; death occurred with the appearances of hydrocephalus. Dry catarrh of childhood is a very obstinate and chronic affection, nearly always proving fatal; it lasts some months. The cases observed by the author were among the poorer classes, and rickets and measles had in several cases preceded the catarrh.

Treatment.—The conditions of the dwelling must be improved; moist sea air is beneficial, and the inhalation of plain watery vapour. The secretions must be aided by the alkaline waters of Bilin, Giesshübel, Gleichenberg, or Ems, alone or with milk and whey. Emetics are useless. The irritative cough is to be treated with narcotics—opium, laurel-water, or belladonna; and cod-liver oil is to be given to improve respiration and nutrition ('Journ. f. Kinderk.,' 1, 2, 1868).

Chronic Bronchitis in Children.

A paper in the 'Journ. f. Kinderkr.' discusses this subject. The following concluding remarks are worthy of notice:

(1) In chronic and tedious cough of children, it must not be hastily assumed that tuberculosis is present, even as is very often the case in chronic bronchitis. The aspect is pale and sickly, the flesh is flabby, the lymphatic glands are swollen, and there are occasionally high temperatures.

(2) The diagnosis must be very carefully made, and the source of the cough as well as its duration and complications must be ascertained.

(3) The prognosis will be so far the more favorable as long as the friends of the patients will encourage the children, and that they are willing to spare no cost or pains to restore health.

(4) In the treatment it is not good to keep constantly the idea of scrofulous or tubercular disease present to the mind as the cause of the continued cough, or to fly to the use of cod-liver oil or malt baths. We must investigate the causes from which the bronchitis has arisen, and is chiefly maintained. The most promising treatment is the use of mineral waters, and especially in the use of cool baths, sea baths, and sea air.

Bronchial Concretions, &c.

M. Bourdillat ('Gaz. Méd. de Paris,' 1868, p. 94) narrates the case of a child, æt. 7, who had taken a French bean into the trachea. Four days after, it not having been removed, pleuro-pneumonia came on, and as suffocation was impending tracheotomy was performed. Much bleeding followed, which was arrested by the introduction of a canula. After a time this was removed again, the wound well opened, when the bean was driven out, surrounded by a mass of coagulated blood. The boy did well. The other cases he mentions were—(1) One where a foreign body in the trachea was taken for croup. (2) A French bean in the trachea; tracheotomy, the bean removed; pneumonia three days after; death. (3) An ear of wild oat was introduced into the air-passages and could not be removed. It apparently caused suppuration, being itself disintegrated after a time and finally expelled along with pus. The cavity healed and the man got well. (4) A bone of a fowl was drawn into the air-passages; it was expelled after six months, and the child got well. (5) A cherry-stone got into the lung, gave rise to symptoms resembling phthisis; was spontaneously expelled, and the patient got well. (6) A small stone reached the bronchi, was encysted, and gave rise to symptoms of phthisis; the patient recovered.

MM. Henocque and L. Leroy give some interesting details in the 'Gaz. Hebd.,' Jan. 3, 1868, as to bronchial concretions. In this case the patient, a man æt. 21, had been ill for a year, had coughed a good deal, and grown thin. Eight months previously, whilst coughing, a quantity of black blood came from his mouth, and for eight days after his expectoration was bloody. Ten days before entering the hospital he experienced a violent rigor and pain in the region of the chest, and he had bloody

expectoration. When seen he was weak and thin, and his pulse quick. Chest dull on both sides; moist râles on both sides. His expectoration had a stercoraceous odour. He gradually sank, and on examining the body the left lung was found congested, the right more so, the lower lobe sinking in water and containing a cavity whose contents possessed a gangrenous odour. Many fibrous bands crossed the cavity. Certain of the bronchial tubes connected with those directed to this cavity terminated in dilated sacs, whose walls were smooth, polished, and red. They contained a red sanious liquid, in which were found a dozen irregular concretions. Most of these were flattened and irregular plates, very thin, others thicker and as if made up of more than one layer. Some had projections from them. Some of these were hard like bone, others more elastic. On examination with the microscope cavities resembling Haversian canals were discovered, and interstices filled with osteoplasts; others, again, seemed to be made up of chondroplasts, filled with cretaceous material. On examining the cartilages of the bronchi near to the spot where these bodies were discovered it was found that these were hard and gritty when cut, owing to the presence of earthy salts. The authors conclude that the concretions were neither formed by the ossification of connective tissue nor from pus, but by the bronchial cartilages, which, becoming ossified and then breaking off when projecting above the surface of the tube, gave rise to the separate portions of bone-like material encountered in the dilated bronchia. To fortify themselves in this position they cite the authority of Andral and others.

Empyema.

Mr. Croskery ('Dub. Quart.,' Feb. 1867) reports a case of empyema resulting from a subscapular abscess. There was not a good history, but when seen the child had an enormous fluctuating mass (subscapular abscess), which the author supposed to be connected with the pleura.

Dr. Cuming ('Dub. Quart.,' Feb. 1868) records a case of empyema in a man æt. 35, who had suffered pain in his left side for six months. When seen this side was dilated, its intercostal depressions effaced, and no movement visible. Impulse of the heart on the right side. Pulse 72, full and soft on the right side, very small on the left; a similar difference existed in the carotids. As the fluid threatened to make its way through the diaphragm, although vented tolerably freely from the mouth, paracentesis was performed, after which the patient improved. It was, however, noticed that whilst the chest diminished above it remained dilated below, and that during inspiration the epigastrium was depressed instead of elevated, and *vice versâ* during expiration. The paralysis of the diaphragm was most noticeable on the left side. It gradually improved, and the man left the hospital, but died soon after.

Dr. Hillier, writing of the empyema of children ('Brit. Med. Journ.,' Aug. 3, 1867) says paracentesis thoracis is not a dangerous operation in children; if performed early, the chances of a good result are great. The cavity should be evacuated as completely as possible without the admission of air, and then closed. If the contents become fœtid a counter-opening should be made and a drainage tube introduced.

Injections of iodine tend to diminish fœtor, but have no effect in producing closure of the cavity. Change of air, nutritious food and tonics, are the main agents in favoring recovery. Very great deformity of the chest from contraction after pleurisy in children may be completely removed if the lungs have not been too long disabled by compression.

Affections of the Diaphragm.

Mr. Callender contributes to the 'Lancet,' Jan. 12, 1867, the history of six cases of fatty diaphragm. We select the second of these, as being the most characteristic. The patient, a female æt. 50, was admitted into St. Bartholomew's suffering from rheumatism with heart complication. For four days all went on well, when she was suddenly seized with orthopnœa with great depression. She was cold, livid, and bedewed with perspiration. In an hour she was almost pulseless, her breathing entirely thoracic, her abdomen fixed and motionless. She sank rapidly. The heart was found to present marks of extensive inflammation, and was fatty. The subperitoneal tissue was filled with fat; the diaphragm was pale, except those portions which rose from the bodies of the vertebræ, the rest was mottled with fat, and presented all the usual characters of fatty degeneration. The other muscles were healthy. In each instance given the heart as well as the diaphragm was fatty. The diaphragm is the muscle which works next hardest to the heart, and might, therefore, be expected to be frequently found fatty. The special mark of death from fatty diaphragm as contrasted with fatty heart Mr. Callender thinks to be the extraordinary breathlessness.

Mr. Howard Marsh records ('Lancet,' March 9, 1867) a pendant case occurring in Mr. Paget's practice, where the diaphragm was abnormally developed, leading to difficulty of breathing and favoring death in pneumonia.

Dr. Bazire, on the other hand, gives a case ('Brit. Med. Journ.,' May 25, 1867) of a woman æt. 71, who suffered from paralysis of the diaphragm. She began in 1865 to feel a sense of discomfort about the diaphragm and a difficulty of breathing. She also lost her voice. She was always worst after a hard day's work, and was better in the morning. She had no sore throat, but her voice became weaker and weaker when speaking till it ceased to be audible. Her breathing seemed regular, and the chest movement was chiefly upwards when she took a deep breath, the epigastrium sank inwards instead of becoming more prominent; whilst during expiration it bulged. She could not breathe fast without distress, but at the ordinary rate was quite able to supply enough air to the lungs. On galvanizing the phrenic the diaphragm could be made to contract. The prognosis of such cases varies. (*Vide* Dr. Cuming's case, previous page.)

Asthma and other Spasmodic Affections.

Prof. Hirtz has tried the effect of subcutaneous injections of morphia in this disease. His first patient was a young girl, handsome and intelligent, and otherwise healthy, but having monthly attacks of asthma. At these times respiration was so noisy as to be heard outside the room. One hundredth of a gramme of acetate of morphia was

injected in the arm, and in five minutes the greatest relief was experienced. The same dose since that time has served to cut short all attacks, although almost every sort of treatment had previously been tried in vain.

Prof. Hirtz has also tried the sulphate of atropine subcutaneously. He finds that in doses of a five hundredth of a gramme it acts more rapidly but less permanently than the above-mentioned quantity of morphia. In chronic cases it may be well to try the two remedies alternately ('Bull. Gén. de Thérap.').

A Sufferer communicates a sensible paper on *spasmodic asthma* to the 'Boston Medical and Surgical Journal' for 1867. He begins by insisting on the value of hygienic measures, and that these are too much neglected by many writers on the subject. He says an asthmatic, by carefulness and attention, combined with an accurate knowledge of the exciting causes of spasm, may live with tolerable comfort to himself, and be able to pursue without much interruption many of the occupations of life. The *season* has a certain influence, rendering men more disposed to attacks at one time than at another. Mere trifles will sometimes counteract every attempt made to benefit the patient. Sleeping in a close bedroom on a feather-bed is with many quite sufficient to counteract the most judicious treatment. *Diet* is important, and the quantity as well as the quality of the food should be noticed. As a rule, no food should be taken after dinner, especially if that be eaten late in the day. One gentleman could never eat a cracker without suffering from asthma, although bread had no such influence. Coffee, when strong and hot, and without milk or sugar, is an efficient remedy during an attack. Wine and spirits, especially taken in the evening, are injurious. If a stimulant is necessary, Jamaica rum or whiskey taken during dinner is the best. Brandy is almost always hurtful. A vegetable diet agrees best with some, but this is a matter for individual experience. The clothing should be warm, and should include a complete suit of flannel or silk to guard against sudden atmospheric changes in a variable climate. Especial care should be taken of the respiration; dust is dangerous, especially house dust, which is more troublesome than street dust; but the most hurtful is that from a feather-bed or a newly swept carpet. This to many is a sure provocative, so is also the dust of hay or straw, or that rising from cleaning horses. Almost every asthmatic has some idiosyncrasy, so that peculiar odours and dusts affect him, while others do not. Ipecacuan powder, as is well known, is a frequent excitant of a paroxysm. A severe fall of temperature is a potent cause for exciting an attack. So, then, in cold weather, especially when it comes on suddenly, the patient should have his mouth and nose covered by a comforter. Night air is equally troublesome to some; here, also, the comforter is efficacious. Curiously enough, riding or driving in an open vehicle gives relief to an asthmatic, even when suffering from an attack. If, therefore, an asthmatic must go abroad in cold weather, let him ride if he can. The arrangements of the bed-chamber are of especial importance; it should be large, furnished with an open grate, and ventilated at the top. During summer the windows had better remain open, during winter

the open door is almost indispensable. The bed, mattress, pillows, &c., should be of hair; no feathers are admissible. The pillows should be large and square, and the bedstead should stand out in the middle of the room, and no curtains should be allowed. Change of place is generally troublesome, and should be avoided. During an attack, smoking a cigarette of mixed tobacco and stramonium often gives great relief. Ether or chloroform are sometimes employed for the same purpose.

Dr. Hyde Salter communicates to the 'Brit. Med. Journ.,' Dec. 5, 1868, a very good paper on the diagnosis of dyspnœa. Dealing with the different forms of dyspnœa, he selects that of asthma as the type, and cardiac dyspnœa as coming nearest to it. In both the dyspnœa is paroxysmal; in both it is most apt to occur during the night; in both the recumbent posture is intolerable, and as the disease is aggravated by exertion, the patient is fixed and cannot move. Dr. Salter thus contrasts their distinctive characters:

In Heart Disease.	In Asthma.
The paroxysms are of a few minutes' duration.	The paroxysms may last hours or even days.
The dyspnœa, is gasping, or panting, a breathlessness rather than a difficulty of breathing.	The breathing is tight, constricted, and difficult.
The respiration is hurried, the movements deep, the rhythm unaltered.	The respiration is often slow, the movements superficial, and the expiration prolonged.
The patient feels as if dying.	However difficult the breathing, the patient feels there is no danger.
Exertion is sufficient to cause a paroxysm.	Exertion alone will not cause a paroxysm.
The paroxysm is not followed by expectoration.	Each paroxysm, as a rule, passes off with expectoration.
Emotional excitement tends to induce a paroxysm.	Emotional excitement tends to cure, and often does so completely and suddenly.
There is no true periodicity.	Periodicity often well marked.

Dr. Salter then proceeds to draw other distinctions between these two, as to the nature of the paroxysm and the effects of food, the period they last, and the relative frequency of dropsy. He next proceeds to separate bronchitis from asthma.

In Bronchitis.	In Asthma.
The typical sounds are moist.	The typical sounds are dry.
Cough is always present.	Often there is no cough.
Winter is the worst time of the year; often the only time.	The hot weather of winter and summer is the worst time.
Cause catarrhal.	Cause emotional, dietetic and various.
Sputum more or less purulent.	Sputum, if any, non-purulent.
Severe dyspnœa never evanescent.	The severest paroxysm may come and go quickly and suddenly.
Often ends in dropsy.	If uncomplicated, never produces dropsy.

As to the distinctions between emphysema and asthma, Dr. Salter arranges them as follows:

In Emphysema.	In Asthma.
Respiration is never free.	Respiration may be perfectly free in intervals.
Drumminess of chest invariable.	Chest only drumming at paroxysms.
Intercostal depressions effaced.	Intercostal depressions strongly marked, especially at each inspiring effort.

Dr. Hill ('Brit. Med. Journ.,' April 11, 1868) recommends valerian in hooping-cough and laryngismus stridulus, whilst Dr. Cheadle in the same journal (June 13, 1868) gives a case in which bromide of potassium (16 gr. in twenty-four hours) seemed to do good. Dr. Horace Dobell (same journal, June 27, 1868) recommends ergot of rye as a remedy for hæmoptysis. Here is Dr. Dobell's prescription, on which comment is needless:—℞ Ergotæ Liquidæ ʒij (to contract the vessels); Tinct. Digitalis ʒij (to steady the heart); Acid. Gallic. ʒj (to clot the blood); Magnes. Sulph. ʒvj (to relieve congestion); Acid. Sulphuric. dil. ʒj (to assist the rest); Inf. Ros. Acid. ʒviij (to make a mixture). A sixth part to be taken every three hours till hæmorrhage be arrested.

The Causes of Cough.

Dr. Nothnagel has made a series of experiments in order to determine the question what parts of the respiratory apparatus are sensitive in such a manner that their irritation causes a cough. His experiments were made upon cats and dogs. (1) A young strong cat had the hyothyroid membrane opened, and a piece of the thyroid cartilage cut out above the vocal cords, so that one could look down clearly upon the cords. When the mucous membrane was gently irritated, or even pretty strongly excited with a sound, no trace of cough was produced, nor when the irritation was extended to the posterior part of the epiglottis and the whole extent of the vocal cords. But when once the posterior wall of the larynx was irritated through the glottis there was violent coughing. From this we learn that irritation of the healthy mucous membrane of the windpipe above the two cords, and of the upper surface of the latter, does not produce cough. A further series of experiments were made to determine whether cough could be produced by irritating the mucous membrane of the trachea. It was discovered that this irritation did produce cough, but the cough was not so immediately and easily produced by irritation of the windpipe as of the higher parts. While the slightest irritation of the larynx produced energetic cough, it was necessary to be very much more rough in exciting the trachea in order to produce the same effect. It is also striking to see how quickly the trachea, when opened, loses its sensibility, so that after a time it is impossible to produce a cough. In this way it is easy to see how some experimenters have discovered different results from Nothnagel's.

These results obviously bear upon clinical experience. We know, for instance, that in a tolerably severe and recent catarrh of the throat pressure on the sides of the neck, and upon the manubrium, immediately produces cough. Irritation of the bifurcation of the windpipe

produces much more energetic coughing from that of the trachea; in fact, this part is as irritable as the larynx. This fact also corresponds with the well-known clinical experience, that in deep-seated catarrh pressure on the manubrium will often cause cough.

In order to test these results, further experiments were now made on section of the superior laryngeal nerves, and the trunks of the vagi above the point of their origin. When both vagi were divided irritation of the larynx produced cough, but irritation of the trachea and its bifurcation had no effect. When the superior laryngeal nerves were divided the larynx might be irritated to any extent without the least cough; but irritation of the trachea and its bifurcation produced coughing. These experiments show undoubtedly that it is not only the superior laryngeal nerve whose irritation causes cough, but that yet deeper branches of the vagus, whose terminations supply the mucous membrane of the windpipe, are also capable of causing cough in a reflex manner.

We now come to the question whether irritation of the bronchial mucous membrane causes cough. It is no use to test this question by irritation from above, as by a tracheal fistula. The experiment which Nothnagel devised was as follows:—He wounded the lung substance through an opening in an intercostal space. The animal did not cough, but on his making a second puncture it coughed suddenly and violently. Dissection proved that the needle on the last occasion had penetrated a bronchus of medium size. In the next experiment, on a cat, portions of two ribs were cut away, and the collapsed lung was drawn out through the opening and fastened with a thread. A bit of the lung was now cut off with sharp scissors. The surface showed one or more bronchial tubes. These were irritated. When the experiment is lucky one may chance to cut a bronchus partly lengthways, and irritation can then be well applied. The result leaves no doubt that irritation of the bronchi will cause cough directly; nevertheless, it must be confessed these experiments are not so exact as those on the trachea and larynx. It is, of course, impossible to experiment upon the smallest bronchial tubes, but it may be assumed that irritation of these also would cause cough. It is impossible to form any conclusion as to the result of irritation of the alveoli.

In another series of experiments the result of irritation of the pleura was tested. A dog was experimented upon, a puncture being made through the muscles of an intercostal space. A sound was then introduced so as to cause a pneumothorax, and the sound was moved about in the pleural cavity. No cough was produced. The opening was then enlarged, and further irritation was set up, but no cough occurred. However, it might be said that, although the healthy pleura does not give rise to cough when irritated, an inflamed pleura might produce cough by its irritation. Accordingly a dog was thrown into narcosis with morphia, and in this condition a solution of croton oil in olive oil was ejected into the pleura. The skin wound was closed. When the animal came to itself it winced and cried, but did not cough. The same evening the pleura was irritated, as in the above experiments, in every direction, and there was evidence of pain, but not the least

tendency to cough. In order to correct the experiment, the trachea was opened. Irritation of the larynx and the trachea at its bifurcation produced violent cough. Dissection showed intense pleurisy, with considerable exudation and effusion of blood in both pleuræ.

The results thus obtained undoubtedly seem in curious contradiction with the commonly observed fact that cough sometimes attends pleurisy, but the fact is, in all probability, that exact observation would show that in simple pleurisy there really seldom is cough. The probability is, in fact, that in those cases where cough is present there is simultaneous affection of the lung or of the bronchi.

Some observers, for instance, Krimer and Romberg, state that irritation of the vagus trunk causes cough. Most experimenters contradict this, and also deny that irritation of the trunk of the superior laryngeal nerve causes cough. A series of experiments have convinced Nothnagel that the latter opinion is correct. In no single case have we got evidence that irritation either of the uninjured trunk or of the central end of the vagus or the superior laryngeal causes cough. It is impossible to say what the sources of mistake may have been. The result to which Nothnagel's experiments led entirely corresponded with the physiological law, that irritation of branches of a nerve much more easily produces reflex phenomena than irritation of the trunk. It shows also a remarkable difference between reflex coughing and reflex vomiting. The latter symptom is easily induced, not merely by irritation of the stomach, but of many other places, and of the nervous centres. People have indeed spoken of a centrally produced cough, but their observations are very doubtful and inconclusive.

In conclusion, the author remarks that there are some other important points yet to be observed as to the origin of cough; for instance, many people talk of a stomach cough, and of the cough in pericarditis. So far he has made no experiments upon these points, but on the whole he is inclined to disbelieve these statements, especially in view of the results obtained by experimenting on the pleura. However, the fact is established that in many individuals cough may be produced by irritation of many particular places. A small branch of the vagus is here probably the medium of irritation ('Virchow's Archiv,' iv, 1, 1868).

Dr. Gueneau de Mussy publishes, in 'l'Union Médicale,' i, 1867, p. 498, some interesting particulars as to cough. After speaking of the nature of cough and the various kinds of cough which the physician can distinguish, he goes on to describe the immediate stimuli to cough. These are, he says, a feeling of tickling at the back of the throat or a feeling of oppression about the larynx, sternum, or even epigastrium; these may be merely reflected, or rather referred, sensations, which almost any morbid affection of the lung is capable of producing, but may be produced in other ways. Cough, when intense, says Dr. de Mussy, may provoke pulmonary congestion, but is even more likely to give rise to emphysema. It may rupture a bronchus and so cause emphysema; not unfrequently it causes the bursting of an aneurism; it frequently gives rise to vomiting, and may produce hernia. Two qualities should always be taken into consideration with regard to

cough—dryness and humidity. A dry cough may indicate a stimulation of the respiratory organs without indicating any tendency to catarrh, but it may also indicate the first stage of catarrhal inflammation previous to the appearance of the morbid secretion. There are some moist coughs accompanied by difficult and viscous expectoration, as if brought from the depths of the bronchial tree, and there are moist coughs which, at each explosion, expel collections of mucus from the air-tubes. Finally, there are mixed coughs where there is the abnormal stimulus as well as the necessity of expectorating. When expectoration is painful and difficult, and accompanied by a violent cough, antimony and ipecacuan are indicated. In dry cough, or cough with little expectoration, sedatives, as opium, hyoscyamus, belladonna, or aconite, are best. Belladonna is best where there is much spasm, aconite where there is fever. If opium is not well borne by the stomach, it may be applied locally, and counter-irritants will also sometimes have a similarly beneficial effect.

Pneumonia, &c.

Dr. Adolph Böhme, of Demmin, says that the sputa in pneumonia may be divided into three kinds, corresponding to three stages of the disease. In the first stage the sputa are odourless, mucous, and viscid; the microscope shows them to contain epithelium, blood, and mucus-corpuscles and nucleated cells. In a further stage the sputa are more copious and more consistent; they are then very tough and viscid, and present the rusty colour; as long as the bronchi remain pervious there are bubbles of air in the sputa. Blood, mucus- and pus-corpuscles are seen, and branching fibrous twigs, pigment-cells, epithelium and nucleated cells. When the temperature suddenly falls and the pneumonia begins to resolve, the sputa become more copious and more fluid, and the rusty colour passes into yellow. Mucus- or pus-corpuscles, of which there were but few in the early stages, are now very numerous, while the fibrin is diminished. The chlorides, which had greatly diminished in the acute stage, now increase again; the further stages of convalescence are marked by a constant increase of pus- and fat-cells in the sputa. In abnormal cases of pneumonia there may be no sputa from first to last; this is mostly the case in children, in lunatics, and in very weak persons. The author does not believe with Chomel, that the locality of pneumonia has any influence. Sometimes the sputa only appear at the height of the disorder or at the beginning of resolution; or they may have altogether disappeared at the latter stage, though they had hitherto been normal. Where pneumonia is preceded by catarrh the sputa may be muco-purulent. Now and then a case is seen where the sputa are healthy, except that from time to time one sputum will be rusty. Occasionally rusty sputa appear as quite a late symptom; this, possibly, is the sign of an extension of the disease. Sometimes a pneumonia of one lung with yellow sputa will be followed immediately by pneumonia of the other lung with bloody sputa, and so on. During resolution the colour of the sputa may often change without serious significance. Deep yellow and green sputa are of no consequence if there be jaundice, but if they occur in the absence of this

they are of bad omen, as they threaten the occurrence of abscess or of cheesy pneumonia. In the latter case the microscope shows many pale blood-cells, pus-cells, yellow pigmented epithelium-cells, and small masses of yellow pigment. Green sputa may be mixed with rusty or lemon colour; they do not usually last long, but pass into rusty brown. The sputa may be black in epithelioma and melanotic phthisis; the latter generally occurs in old people, and is attended with continued pyrexia ('Deutsche Klin.,' 22, 23, 25, 1868).

Dr. O. O. Heinze writes upon the relation of severe head symptoms to temperature in pneumonia, in reference to the opinion of Liebermeister that these disturbances of brain function in acute diseases are due to the effect of a high temperature on the nervous centres. Among severe head symptoms Heinze reckons sleeplessness, delirium, hallucinations, sopor; the slighter symptoms of which Liebermeister speaks are rejected as having no necessary connection with acute disease. Of 317 cases of pneumonia 98 had bad brain symptoms; in 67 of these the brain disturbances began after the crisis; in the rest they occurred when there was high or moderately high fever, but often lasted into the period of lowered temperature. It might be objected to these observations that it was the long-continued action of a previous high temperature which really produced brain symptoms; if this were the case we should find that brain symptoms occurred earlier in cases of high temperature than in cases of low temperature. The observations of the author contradict this opinion. In the severest forms of intermittent, relapsing, and yellow fever, in pleurisy, and other pyrexial diseases, brain symptoms are often wanting, while they may occur in the most trivial cases, and also not rarely in the defervescent stage of typhoid. Heinze mentions the curious fact that of 117 cases of pneumonia of the upper lobes 47 had severe brain symptoms, while of 200 pneumonias of the lower lobes only 51 had the same complication. It is worth notice that Liebermeister's cases were pneumonias of the upper lobes; that author thinks that this affection is longer, and attended with more severe fever, than other pneumonias, an opinion which Heinze shares. Age seems to have nothing to do with the frequency of delirium, nor is it correct to attribute the tendency universally to alcoholism, for out of 98 cases only 34 occurred in drinkers. The majority of cases of delirium occurred in March and April, and not in hot months ('Archiv d. Heilk.,' p. 49, 1868).

Dr. Beckler relates some cases which bear on the connection between pneumonia and tuberculosis. He draws from these cases the following conclusions:—(1) A deposit of miliary tubercle may occur under the form of a pneumonia and general typhoid symptoms. (2) It may also take the form of a simple pneumonia with a true crisis, and may end in cure. (3) Where pneumonia is preceded by general symptoms for a long time, such symptoms tending to appear in tubercular deposition, the latter must be held to be the source of the pneumonia ('Schmidt's Jahrbuch.,' p. 172, 1868).

Dr. Waters, writing on pneumonia ('Brit. Med. Journ.,' Jan. 19, 1867), holds that pure pneumonia consists of an inflammation of the walls of the air-sacs, that the blood-vessels implicated are the branches

of the pulmonary artery, and that the bronchial capillaries are in nowise concerned, except there be also bronchitis. He believes that engorgement is not the earliest phenomenon, nor that crepitation is the first outward index of pneumonia. He holds that there is an antecedent stage, characterised by dryness and intense arterial congestion associated with a harsh, loud, respiratory murmur.

Dr. Sieveking, in a lecture on pneumonia ('Brit. Med. Journ.,' Feb. 22, 1868), gives some illustrations of various kinds of treatment. He points out that, although the physical signs may be the same, the cases may by no means be identical. He illustrates, by appropriate cases—no treatment, treatment by bleeding, treatment by salines and alkalines, and treatment by stimulation.

Gangrene of the lung, diaphragm, and spleen.—Dr. Hertz, of Greifswald ('Virchow's Archiv,' xl, p. 580), narrates the case of a girl, æt. 25, who had been healthy to within 11 weeks of her admission into the Greifswald Infirmary, on the 9th of September. At this period the menses, after a wetting, stopped, and she complained of pain in the belly, with certain other symptoms. On admission the chest was dull at certain points, and there was some minute crepitation audible. Five days after admission there was slight swelling of the lower portion of the right thigh, this next day had extended to the whole limb. On the 17th there was much swelling and pain in the belly, her temperature rose, the pulse was 148, and the urine was highly albuminous. On the 18th there was slight œdema of the lung, and on the next morning she died. After death there were found many adhesions between the lungs and the walls of the chest. The left pleura contained much bloody fluid. On removing the lung the diaphragm gave way, and a quantity of extremely fetid fluid of a dark green colour rushed out of the abdomen into the chest. The lung itself was completely disorganized, especially towards its base. The branch of the pulmonary artery going to the upper lobe was blocked by a thrombus, a smaller one was found in the branch going to the lower lobe. The right lung was less disorganized, but œdematous, and towards its base partially gangrenous. The arteries also contained thrombi. The abdomen showed signs of recent and remote peritonitis. From the orifice in the diaphragm, which was completely gangrenous, extended on every side a thick greenish-yellow layer of exudation. The spleen was almost entirely gangrenous, and the liver fatty. The right common iliac vein contained a decolorised clot extending into the external and internal iliacs as far as the femoral. Similar clots existed in the deep femoral and saphena. These clots had doubtless furnished the embolic masses found in the lung, and which had caused its destruction.

Dr. Banks, in the 'Dublin Quarterly Journal,' Feb. 1867, records an unusually interesting case of gangrene of the lung. The man was 34 years old, and had been very intemperate all his life. The history is very imperfect, but for two months he had been spitting up purulent matter of an extremely offensive character, so as to induce nausea and vomiting in himself. A sudden aggravation of his symptoms induced him to come into hospital, which he entered in a dying state. His prostration was extreme, his respiration 72 a minute, his pulse feeble

and flickering, rising to 130. His lips were livid, and his face deadly pale; he had a harassing cough, and he brought up an enormous quantity of horribly offensive fluid, greenish in colour. The patient would not suffer his chest to be carefully examined. Stimulants had no effect in arresting the disease, and the man died in 48 hours. Both lungs were adherent to the pleura, and were of a greenish-black colour, with patches of a deeper hue, which on being cut gave forth a most fetid purulent material. The lungs were soft and friable, chiefly a dark green shreddy pulp, no part retaining its original texture. The right lung contained in its upper part a large irregular cavity. Dr. Banks thinks that many of the so-called cases of gangrenous lung are only instances of fetid pulmonic abscess, the sequelæ of pneumonia. He knows of no other instance where the lungs were throughout gangrenous.

M. le Debardeau records ('l'Union Méd.,' iii, 1867, p. 57) a curious case of ossification of the lung. The subject was a man æt. 56, who was evidently tuberculous. His skin was warm and dry, his pulse 100; he had great dyspnœa, but no localised pain. The right side of his chest was mostly affected, being extremely dull on percussion, with crepitant and subcrepitant râles. Under the clavicle was a souffle, strongly marked, and slight gurgling, with strongly marked bronchophony. The sputa became nummular. After death it was found that the lungs, especially the right, were extremely adherent. Beneath the second and third ribs in front was a cavern, the size of a nut, filled with pus. Surrounding it were found in the parenchyma of the lung a number of plates, or other masses, apparently of bone. Ranvier showed that the bone had been formed by interstitial pneumonia, exactly as bone is formed in fibrous tissue. Some of the masses were cylindrical, having surrounded arteries.

Dr. Grainger Stewart contributes to the 'Edinb. Med. Journ.,' July, 1867, a most valuable paper on dilatation of the bronchi. He first points out certain spurious forms of the disease. 1. A general dilatation, as in hooping-cough. 2. Dilatations from stricture. 3. From hardened lung-tissue. 4. Abscess cavities simulating dilatations. He points out two kinds of true dilatation, the reniform and the saccular, and he details the condition of each layer of the bronchus in each. He gives the contents of these dilatations as—yellow mucus, inspissated greyish-yellow material, and fetid mucus which has undergone change. The contents may be hardened. The conditions of the surrounding lung substance are next given; it may be unaltered, it may be soft and atrophied, it may be fibroid, it may be an abscess, or it may be gangrenous. Bronchiectasis is most common in the lower and middle lobes of the right lung. The theories as to the cause of the disease are next given, then follows its clinical history, with cases exemplifying the diseased condition.

Pleurisy.

Prof. Kussmaul discusses the question of paracentesis thoracis. He reports 16 cases in which the operations were performed for pleurisy, empyema, and pyopneumothorax. He says that the reason why the

operation so often fails is, to a large extent, because an exact appreciation is not made of the circumstances in which it is most effective. One must have a clear idea of what one intends to do, and especially whether puncture or incision, or even resection of the ribs, may be the best proceeding. He is convinced from his experience that the operation, properly employed, is a most valuable addition to the resources of medicine.

Kussmaul relates the case of a boy of 5 years with a purulent effusion of three months' standing, and in whom suffocation was imminent. A fine trocar was introduced in the sixth intercostal space on a line with the nipple; greenish-yellow pus without smell escaped. In twenty-four hours 24 oz. of pus escaped through the canula without any entrance of air. The most striking improvement was observed. Pus was evacuated during six months through the tube. When the exit of pus was prevented by the valvular closure of the tube the patient invariably got worse, and was immediately benefited by a fresh evacuation. The patient was discharged in six months, but his parents did not sufficiently attend to the escape of the pus, and in three months he came back to the hospital. An iodine solution was then injected daily, and the secretion was much diminished. In four months' time he was discharged with a slight contraction of the left side, but otherwise in quite good health.

In the case of a child of 18 months, with purulent effusion of four months' standing in the right pleura, a silver canula was introduced into the fifth intercostal space and fastened in. In five or six weeks the child was dismissed with considerable contraction of the right side, which, however, righted itself after some years.

In the third case there was pyopneumothorax following puerperal fever. There were great constitutional distress and dyspnœa, and also fetid expectoration and breath. An incision was made in the eighth intercostal space two inches from the spine; air passed out first and then 100 oz. of stinking pus. The fever was much reduced. After the operation an elastic catheter six inches long was introduced. The pus passed out from this with each cough; if its exit was barred feverishness at once occurred. The lung gradually assumed its proper size, the vesicular breathing was heard; as the secretion diminished, the catheter was removed. The patient was cured in eight weeks after the operation.

In another case, a girl of 19, whose family was phthisical, had double pneumonia and bronchitis with extensive empyema of the right side; the left knee-joint and ankle were painful and swollen, and it seemed as if their inflammation was due to purulent infection. A puncture was made in the fifth intercostal space on a line with the nipple, and the wound kept open. The pus which flowed out soon became stinking; an elastic catheter was therefore introduced. So long as free discharge of the pus occurred the joint affection disappeared, but returned if there was a stoppage. The wound was enlarged and a bougie introduced to keep it open. Repeated injections of sulphite of soda and camomile tea were introduced with the best effect upon the character of the pus. Some little time later injections of iodine were substituted. The patient

now steadily improved and in four and a half months from the operation was entirely cured.

The operative treatment of empyema in such cases as this is the more important, as experience has shown that absorption of the pus easily produces tubercle, especially in subjects who are predisposed to it.

In the so-called cases of empyema necessitatis the operation is yet more plainly required, and the prognosis is very favorable where it is done ('Deutsches Archiv f. Klin. Med.,' 4, 1868).

Phthisis.

The pathology, and in consequence the prognosis, of this disease have received important additions and modifications during the past two years. The results of the various researches which have been recorded above, on the subject of tubercular inoculation, have added the last links which were necessary to the proof that under the word phthisis—used roughly, for destructive pulmonary disease attended with wasting—there are really included a variety of disorders with most important differences in their essential nature. Several things have become abundantly clear. The most practically important of these is the fact that wasting disease, attended with *cheesy* deposit in the lungs, may certainly, and in truth very often does, result from a mere neglected catarrhal pneumonia or other inflammatory affection, in which there is increased cell-formation within the finer bronchial tubes, which extends itself to the alveoli, and that a considerable proportion of such cases are curable. Secondly, that miliary or grey tubercle (to which the term "tubercle" increasingly tends to be limited) is, in the majority of instances at least, altogether a secondary production, the result of absorbtion of infective matters of various kinds, of which cheesy matter from lung deposits is, perhaps, the most common. It is apparent that the advent of true tuberculosis, in a case previously distinguished only by cheesy deposits and by more or less constitutional hectic, is the commencement of a new and much more dangerous state of things, from which recovery rarely, we may practically say almost never, occurs. A third series of facts which have been brought into great and possibly exaggerated prominence are those which are observed in a class of cases distinguished by a special tendency to fibroid changes within the lung. Only a few observers maintain that these cases form an entirely separate group; yet in a prognostic point of view it will certainly henceforth be of the highest consequence to note the following group of phenomena:—Limitation of deposits to one lung; slow progress of the disease; absence of fever and sweating; tendency to retraction of the chest wall.

Finally, it may be noted that there is a greatly increasing tendency to consider *hæmorrhage* as a comparatively unimportant occurrence in pulmonary disease. So far from its having that serious or even almost necessarily fatal augury which was ascribed to it by some of the most distinguished classical authorities not many years since, it is the tendency of recent observation to associate hæmorrhage rather with a curable class of cases, and to regard it as frequently affording a harmless and even beneficial relief to mechanical congestion.

Dr. Burdon Sanderson, in a clinical lecture delivered at Middlesex Hospital, explains how pneumonia may become phthisis. By pneumonia Dr. Sanderson understands inflammation. By phthisis he means disintegration. By tubercle, granulation or the growth of miliary granules, not in themselves, but in the interstitial tissue. Of pneumonia there are great varieties. For our purposes we may divide them into the catarrhal and croupous. Croupous pneumonia is a disease of limited duration and rapid course, with regular and febrile symptoms, which ends definitely in resolution or death. It consists in the rapid pouring out into the air-cells of a coagulating fluid. Under the microscope this is distinguished from other consolidations by the fact that it contains no uniform corpuscles, none except those which are to be found in the healthy structure. The accession of croupous pneumonia is more or less sudden, and often attended with herpetic eruption round the mouth. The consolidation of the lung progresses rapidly and is of great extent. The fever is marked by an abrupt rise of temperature as well as by chemical changes in the urine. In cases that recover health is regained nearly as rapidly as it was lost, and the effused lymph disappears rapidly. This disease seldom or never leads to phthisis. The great number of the cases of pneumonia that one sees are not of this kind; they are cases in which the consolidation originates in catarrh, in consequence of which the air-cavities to which the affected bronchial tubes lead become filled, not with fibrine, but with a material which consists almost entirely of cells or corpuscles. These cases in their etiology and essential nature belong to the great family of bronchial catarrhs. The practical distinction between this sort of consolidation and the other is that it is much less apt to be absorbed. Croupous exudation goes like snow in sunshine as soon as the patient begins to get well. Catarrhal consolidation goes, it may be sooner or later, but rather later than sooner, and is very apt not to go at all. When this happens the result is called in popular language a neglected cold. It is called so on account of its usual mode of origin. The patient gets a cold on his chest, he recovers from the feverishness and short breath which he had at first, and thinks that he is better, but he continues to expectorate and does not regain appetite. He returns to his occupation, notwithstanding that he is losing rather than gaining flesh and continues to sweat at night. This state of things may go on for months before he thinks it necessary to put himself under medical treatment. When at last the chest is examined the movement and breath sounds of one side are found defective, and on careful percussion patches of dulness are detected, sometimes at one apex, just as often in the flank at the lower angle of the scapula or in the axilla, or elsewhere. The case which was before one of bronchial catarrh is now one of phthisis; chronic catarrhal pneumonia with permanent consolidation.

What has happened here? Is the popular notion true that the cold has become consumption, or the dogma of Laennec true, that the patient, who before had inoffensive catarrh, has contracted a specific and malignant disease? The only answer to this question must come from careful study, both of its pathological and its clinical aspects. Catarrhal pneumonia is familiar to us in children, for it often kills

them. Among the poor it follows measles and hooping-cough, with most fatal results. The chief reason of this fatality is the mechanical imperfection of the infantile chest and consequent liability to local collapse of lung. In fatal cases in children we find—

(1) Intense catarrhal inflammation of the bronchial tubes down to the minutest branches, sometimes general, sometimes confined to the lower lobes; the bronchial mucous membrane being thickened, red, and swollen.

(2) Collapse of the posterior part of the lower lobes, with emphysema of the anterior margin of the lung.

(3) Dissection of the collapsed parts show the minutest broncheoles distended with mucous secretion resembling pus. When inflated those lobules which are merely collapsed readily expand, but there are always some in the midst of the expansible ones which will not expand. These are solid masses of lobular pneumonia. Structurally such patches are bits of lung-tissue, all but the air-cells of which are choked with innumerable nucleated cells. These cells are not tubercle-corpuscles in any intelligible sense, or exudation-corpuscles, nor, indeed, cells of any special or newly produced kind, but simply cells of the same kind as those which are found in the air-cells of the healthy organ, collected together in extraordinary numbers, but in every other respect ordinary and common. Their accumulation is the ultimate fact which distinguishes mucous or catarrhal inflammation from fibrous. Some authorities will say that a mere increased number of cells is no true ground of a distinction from fibrogenous pneumonia, but in truth the cellular constitution of the deposit is just what makes it dangerous. At first these are masses of lung-protoplasm, but they soon die. They tend towards necrosis by becoming granular; their fatty elements separating from their albuminous. No doubt in many instances, as convalescence is established, the consolidations left by catarrhal pneumonia in childhood disappear, and the process of fatty degeneration itself may lead to the expulsion of the diseased products by expectoration. But, as a rule, such products remain and become more slowly the subject of fatty degeneration, namely, of caseation, the essence of which is the loss of water by absorption, so that the fatty material becomes condensed and opaque white or yellowish.

As regards the tendency to inheritance of caseous phthisis, Sanderson favours the view that phthisis itself is not inherited, but rather that such structural tendencies are inherited by the child from the parent that the occurrence of such an accident as catarrhal pneumonia is more likely to be followed by the hasty and imperfect cell formation, so easily changed into cheesy tubercle, than in other persons.

In Germany the most important work on the subject of varieties of phthisis within our period is the pamphlet of Felix von Niemeyer ('Klin. Vorträge üb. die Lungenschwindsucht,' Berlin, 1867). Niemeyer separates caseous phthisis entirely from the miliary form, and ascribes it to chronic catarrhal pneumonia. Not only the subject of caseous phthisis, but that also of miliary tubercle, has made great progress. Pathological anatomy has now shown that many structures, superficially like miliary tubercle, are really nothing but the cut ends of

minute bronchi, with cheesy contents and surrounded with thickened cells inflated with cheesy matter. The final result is that in a vast number of cases of "phthisis" not one single tubercle can be found, and the thickenings and alterations of the lungs are to be traced solely to the destructive pneumonia. Niemeyer does not, however, hold with the view that true tubercle is rare in caseous pneumonia; but he considers that the tuberculosis is usually a secondary event, occurring at an advanced stage of the disease. Only in a comparatively small number of cases, where tubercles are found in the lungs along with the products of caseous pneumonia, can we establish by reasonable proof the opinion that the tuberculosis has been the primary event, and that the cavities have been produced partly by the softening and emptying of tubercle-masses. Here the tubercle is probably first produced in the bronchial mucous membrane, as Virchow showed. The pneumonic process which complicates this true tubercular consumption is far more extended than in the form of phthisis previously described. The greater the contrast between the high fever, the rapid wasting and severe dyspnœa, and the slightness of the consolidation-signs, the greater the patient's danger; while, on the other hand, the prognosis is better if there be a just correspondence between the two sets of phenomena, for in the latter case we may hope that there is only a pneumonic, and not a true tubercular phthisis.

Niemeyer asserts that it is quite wrong to suppose that only one form of pneumonia—the "caseous"—can lead to phthisis, or that any one form necessarily terminates in phthisis; but doubtless the cheesy form of pneumonic deposit is more likely to lead to mischief than the croupal, from its much less facility of solution and consequent absorption. Acute catarrhal pneumonia most frequently occurs in the course of measles and of hooping-cough; it is lobular at first, but afterwards extends to whole lobes. But an ordinary genuine catarrhal pneumonia, also, not rarely leads to fatal consumption, by extending to the alveoli, and causing consolidation of the lung-tissues. Where this happens rapidly, with the classic symptoms of "galloping" consumption, it has been commonly the practice to speak of a "tuberculous infiltration," masked by a false show of a mere feverish bronchial catarrh; but this is incorrect.

Chronic catarrhal pneumonia is one of the most frequent of all diseases, and hence the mistaken notion that tubercle of the lung is common. It is not difficult to understand why it should so much more frequently lead to cheesy infiltration than the acute form of catarrh does. The protracted course of the disease gives time for a large agglomeration of the cell-elements (which are constantly proliferating with abnormal rapidity), and the consequent mechanical distension of the alveoli accounts for much of the tendency to necrobiosis. Chronic catarrhal pneumonia may occur either in previously sound lungs, or in lungs already consolidated and cavernous; in the former case it may lay the first foundations of caseous phthisis, in the latter it aggravates already existing mischief. Persons with "sound" health have no immunity against catarrhal pneumonia, though the weakly are more frequently affected.

However produced, cheesy deposits by no means always lead to softening and formation of cavities; the danger arises chiefly from pressure on the surrounding tissues and vessels; possibly also in some cases from extension of the proliferation from the superficial cells to the tissues themselves. In cases where the cell multiplication is more moderate and exercises less mechanical pressure the cheesy masses may by degrees become thickened, and the atrophied cells may fall into mere detritus, the end of which process is calcification. In other cases complete fatty degeneration and softening may take place and be followed by entire absorption. Where either the one or the other of these latter changes occur there is considerable formation of connective tissue in the lung. The calcified concretions are encysted and the space of the absorbed matter is filled with connective tissue, producing consolidation and impermeability to air. The contraction of the new tissue produces shrinking of the lung and retraction of the chest-wall, and consequent dilatation of the bronchi. This kind of formation of cavities is commonest in chronic phthisis. It will thus be understood that Niemeyer considers that consumption arising from chronic pneumonia by no means a specially dangerous disease. He thinks that the greatest danger of most phthisical patients is that they may become tuberculous. He believes that the danger of intercurrence of tuberculosis is precisely the same whether the cheesy products which are apt to provoke its occurrence were the results of a croupal or of a catarrhal pneumonia, and if of the latter whether that had been acute or chronic. Niemeyer next remarks on the fact that almost without exception, when tuberculosis attacks previously sound lungs, there are simultaneous productions of cheesy products in other organs, which may owe their existence to the most various diseases. Niemeyer mentions with approval the opinion of Buhl (who holds to the old view, that cheesy deposit and tubercle are identical), taking that view, he was justified in saying that every tissue and every exudation may, at a certain stage of retrogade metamorphosis, become tubercular matter.

In short, Niemeyer thinks himself justified in saying that tuberculosis in the majority of cases is a secondary result, produced in a manner not as yet intelligible, of the influence of cheesy product on the organism. Buhl (whose merits are freely allowed by Niemeyer, though it is just now the fashion to accuse the latter of having stolen from him) had already insisted in the strongest way that miliary tubercle always depended on pre-existing cheesy deposit. He went further than this, and spoke of tubercle as a result of a poison analogous to that of pyæmia taken up into the blood, but Niemeyer cannot approve of this view, and thinks it has done much to hinder progress. The theory of the constant dependence of tuberculosis on cheesy disease is one-sided and overstrained.

Niemeyer expresses himself strongly on the disputed point of the inheritance of tuberculosis. He declares that, using the word in its correct term, no such fact has been satisfactorily proved. The only case in which we could speak of it with confidence is where the father or the mother had suffered from tuberculosis at the moment of conception, and where the child born was directly affected with tubercle, and

not merely secondarily in consequence of some other disease. In childhood, as tubercle of the lung is uncommon, we should here have to do chiefly with the tubercle of the brain membranes; but this latter affection is very rarely primary, there are nearly always cheesy deposits in the bronchial glands and elsewhere. Equally unsatisfactory, as proofs, are those cases in which an adult, the child of notoriously tuberculous parents himself, becomes tuberculous; for here, both in child and parents, the tuberculosis may have been only the last stage of such processes as have been described.

Passing over a great many points of interest, we must finally mention Niemeyer's conclusions on the subject of pulmonary hæmorrhage, which are as follow:

(1) Abundant bronchial hæmorrhages occur more frequently than is supposed in people who neither then nor ever afterwards are consumptive.

(2) In many cases the commencement of consumption is preceded by abundant hæmorrhage, but there is no genetic connection between the two, which really arise both from a common source. The patient has, in fact, a predisposition to them both.

(3) Hæmorrhages from the bronchial mucous membrane proceeding from consumption are sometimes in true genetic connection with it, inasmuch as the hæmorrhage may lead to inflammatory processes in the lungs, terminating finally in their breaking down.

(4) Bronchial hæmorrhages occur much more frequently in the course of a consumption than before the disease. They really refer to the time in which the lung disease was as yet latent.

(5) Bronchial hæmorrhages occurring in the course of consumption may make that disease fatal by means of their tendency to hasten the destructive inflammatory processes ('Klin. Vorträge über d. Lungenschwindsucht,' Berlin, 1867).

Fibroid Phthisis.

Dr. Andrew Clark is the chief exponent in this country of the view that there is a disease commonly confounded with tubercular consumption, which nevertheless differs in many essential particulars, and especially in the fact that the deposited material is mainly of a fibroid character. In a report which he read at the Clinical Society of London he thus summarises the more important circumstances which lead to the diagnosis of fibroid phthisis.

(1) Fibroid phthisis may have a constitutional or a local origin.

(2) When the disease has a constitutional origin, the fact will be indicated by the presence of signs of fibroid disease in other organs and tissues by white skin spots, by corneal degenerations, by urine containing granular matter, granular casts, or albumen; by evidences of cirrhotic or amyloid liver, of enlargement and hardening of spleen, and induration of the nervous centres.

(3) The constitutional state of which these growths, deposits, or degenerations, are the manifestations, seems to be closely connected with, if not dependent upon, the abuse of alcohol, syphilis, rheumatism, gout, exhausting discharges, and defective excretion.

(4) The actual product of this state appears either as a true fibrous tissue or as a tough, hard, amorphous fibrogenous substance. The latter is closely akin to the amyloid material, and even in the lung is sometimes reddened by iodine. It does not appear to be the product of cell proliferation, but to be the result of a real exudation in the ordinary sense of that term. The former can always be traced into continuity with perilobular, peribronchial, perivascular, or subpleural areolar tissue. The latter occupies the alveoli, and is often found in isolated patches; structural elements such as are seen in adjacent plots are often found in it. When nuclei are present in it, it is the ordinary circular nuclei of the alveolar walls, and not the spindle-shaped or oat-like nuclei of connective tissue. In other organs the fibrogenous material sometimes contains oat-shaped nuclei derived from proliferation of the vascular walls. To this source are to be referred many of the nucleated fibres and spindle-shaped cells supposed to be illustrations of the cellular development of fibrous tissue.

(5) When the disease is not of constitutional origin there will be found evidence either of the pursuit of some occupation exposing the patient to the inhalation of irritating substances of the existence of tubercular phthisis, long-continued bronchitis, or of some previous attack of acute disease, such as fibrogenous pleurisy, pericarditis, or what the author has called of corpuscular form of pneumonia.

(6) The disease commonly affects one lung, and more commonly the left than the right.

(7) If the disease affects both lungs, it is, as a rule, either the effect of mechanical irritation or it is accompanied and has probably been caused by the presence of tubercles. In rare cases the double affection may be caused by rheumatism or syphilis.

(8) In fibroid phthisis there is always contraction of the chest-walls. The percussion dulness is harder, higher pitched, and more uniformly continuous than in any other lung disease; resistance of thoracic parietes is greatly increased; intercostal spaces are depressed; sometimes the lung is tubercular; vocal fremitus is at one time increased, at another time greatly diminished. Over the fibroid lung one hears blowing breath sounds, often without audible prolongation of expiration, occasionally cough, dry and moist râles, superficial creaking, and diffuse bronchophony; over cheesy deposits of any extent the breath-sounds are sharply tubular, the expiration prolonged, and the vocal resonance bronchophonic, sniffling, and circumscribed.

(9) If the apex of the diseased lung is early involved in the solidification there is reason to suspect the existence of tubercles. If there is moist crackling in the supraspinous fossa the suspicion amounts to probability; and if with the slightest dulness over the summit of the opposite lung there is any moist crepitation, doubt is practically no longer possible.

(10) When the lung below the solidification is healthy expiration is peculiarly prolonged and puffy.

(11) When cavities exist they commonly occupy the mammary region; occasionally they are found in the base, and with extreme rarity in the summit of the lung.

(12) When about the middle of the lung several cavities lie near together in a horizontal or diagonal line, and are bounded by solidified lung, they are, in all probability, due to dilated bronchi; cavities resulting from the breaking up of cheesy deposits are commonly isolated, irregularly placed, larger, and yield on auscultation unmistakable cavernous or amphoric breathing and pectoriloquy. The only certain evidence, however, of the existence of cheesy cavities is the presence of areolæ of elastic tissue in the sputum.

(13) In the neighbourhood of the solidified lung it is not uncommon to find patches and tracts of lung in a condition of extreme vesicular emphysema, and the atrophic changes constituting which appear in many instances to be due to plugging or to some other obliteration of branches of the pulmonary artery. It is, therefore, a statical as opposed to a dynamical emphysema.

(14) When the left lung is affected the heart is usually displaced upwards and a little outwards. When the right lung is affected the heart is drawn chiefly outwards and a little upwards. In both cases a low pitched systolic bruit is commonly heard over the pulmonary artery.

(15) The cough is paroxysmal, and ordinarily induces vomiting. The expectoration varies. It is usually yellowish, greenish, or ashen grey, studded with pigment, streaked with blood; sometimes fetid, and ejected with difficulty after several ineffectual fits of exhaustive coughing.

(16) The general symptoms, viewed collectively, are strikingly different from those of tubercular phthisis. The skin is—local sweats excepted—dry and inactive. There are no profound exhaustions, no continuous elevation of temperature, no evening fever, seldom any hectic flushing till the disease is far advanced; the breathing is quiet, and the pulse generally 84.

(17) A slight œdema of the lower extremities is very common in the course of this disease, and almost always present at its close.

(18) Patients who have suffered from fibroid phthisis, whether of local or constitutional origin, become at last padded, waxy-looking, and cachectic.

(19) The disease is commonly slow in its progress, and when it complicates tubercles it retards disintegration and greatly prolongs life. This may explain some of the cases of unusually protracted phthisis in spirit drinkers.

(20) The frequent occurrence of even copious hæmoptysis, and the setting in of diarrhœa in the course of this disease, may justify a suspicion of the development of tubercles, but are not conclusive evidence of their presence. Hæmoptysis, diarrhœa, and ulceration of the bowels, often occur during life, without a solitary tubercle appearing after death ('The Clinical Society's Transactions,' 1868).

The Contagion of Pulmonary Phthisis.

Dr. Windrif, of Cassel, writes a paper on this subject. He quotes the partial statement of Guibout, who leans to the conclusion that this disease is probably contagious. Dr. Windrif brings forward certain

facts in support of this position. In one case, a medical student, æt. 30, went home to his family with consumption. On his death his foster-brother received his clothes. He had been quite healthy before, and there was no phthisis in his family. In a year's time, however, he showed all the symptoms of the disease, which was rapidly fatal. In the second case a somewhat feeble youth married a woman of strong constitution and of healthy family, and died a year after marriage, of consumption. His wife was confined, and seemed to be recovering well during the life of her husband, but scarcely had he died when she developed consumption. In the third case a fine and strong woman, æt. 35, was somewhat superstitiously observant of religious exercises. She caught cold at church, and it became evident very soon that she was consumptive. Her twin sister unfortunately took to wearing her dresses during the latter part of her illness. She was very soon attacked with the same symptoms, and died six months later. In the fourth case a young woman, of lymphatic temperament, but tolerably strong, had a most abundant secretion of milk after her confinement, so as to be extremely exhausted. At her next confinement the child proved very weak, and died of tubercle in the mesentery. The mother soon developed signs of consumption, which proved fatal. She was attended with great care by a strong and healthy servant, who had never shown the least chest affection. A month after her mistress's death this girl became undoubtedly tuberculous, and died a year after her mistress. The husband of the latter for a long time had symptoms of bronchitis, which seemed as if they would pass into consumption, but there is reason to think that this did not depend on any contagious influence. Another case was that of a young man who became consumptive, and his mother, of 60 years of age, and not at all apparently disposed to tubercle, almost immediately after his death developed signs of phthisis. She died in about three years.

The author feels no doubt that these and many other cases, rightly interpreted, go rather to show a tendency of phthisis to spread by contagion than a community of hereditary influence producing the same disease in various members of the same family. He thinks that the most dangerous circumstances are those in which a healthy person sleeps with a consumptive patient, and thus constantly breathes the same air. He does not pretend to say in what manner the tubercular matter effects its contagion, but he points out that phthisical patients exhale a very peculiar odour, a circumstance which is also noticed in the diseases which undoubtedly do propagate themselves by contagion. In those cases where clothes seem to have carried the contagion we are at a greater loss to understand the process; nevertheless, the fact seems indisputable. The author, however, admits that the whole theory of phthisis miasm is a mere hypothesis; but that the disease is contagious he has no doubt. The practical consequences of this belief are important. Healthy people should never sleep with consumptive persons, and in cases where the poverty of the family renders it difficult to provide separate accommodation there is a strong case for charitable interposition. The use of the clothes of consumptive persons should also be strictly forbidden. No doubt we have not proved our

case on this point; but there is enough suspicion to make it imperative for us to act on the safe side ('Journ. de Méd. de Bruxelles,' xliv, 1867).

Dr. Marcet gives his experience of the treatment of phthisis by inhalation of an aqueous solution of carbolic acid under the form of spray. He had been seeking for some antiseptic agent which could be introduced into the lung without interfering with the general functions of the body, and decided on trying carbolic acid. The inhalation of vapour from a solution of carbolic acid has been already tried, but the use of it under the form of spray is probably new. The results that he has obtained may be shortly expressed as follows:

(1) When a solution of from half a grain to one and a half grain of crystallized acid in an ounce of water is inhaled as spray by a patient in the chronic first stage of phthisis, before softening has taken place, and perhaps also when the process of softening is just commencing, or at the very outset of the second stage, relief is thereby obtained, and in some cases it appears to assist, with other means, in arresting the disease. After using the spray the patients feel as if their breathing becomes easier and deeper. On moving about, and going up stairs, there is less dyspnœa. The stitch often felt, or some restriction to the expansion of the chest in the act of breathing, is partly or entirely removed. Cough is frequently relieved, and expectoration may be considerably diminished. The absorption of any fluid in the smaller bronchi and pulmonary vesicles appears to be favoured, as shown by lessening of the crepitation. He cannot confidently assert that he has known any plastic material in the lungs to be absorbed while the spray was being used, still he believes that in some of his cases the dulness on percussion has diminished, and even disappeared, partly from the effects of the carbolic-acid spray. The treatment with the spray should not be adopted exclusively, but in addition to the use of counter-irritation, cod-liver oil, &c.

(2) In cases of acute second and third stages of phthisis, where the process of softening is going on rapidly, accompanied with quick pulse, high temperature, debility and emaciation, the inhalation of the carbolic acid spray, although it may afford temporary relief, appears objectionable from its depressing influence over the action of the heart. Marcet also thinks it advisable to withhold the use of the spray in the first *acute* stage.

(3) A solution of carbolic acid containing more than two grains to the ounce should, as a rule, not be used, from its depressing action on the heart. From the above it will be seen that the spray should be employed with great caution; and if giddiness, faintness, trembling, with a permanently weakened pulse, or any increased irritation of the lungs, should result from the treatment, it ought to be at once discontinued. Marcet thinks it doubtful whether, after all, the benefits of carbolic-acid spray in phthisis are merely due to its antiseptic action. He uses the spray as obtained from Clark's hand-ball spray producer, or sometimes from Mathieu's spray producer. He has tried and given up the steam spray-producing apparatus, from the difficulty of regulating its action. He thinks it sufficient to inhale the spray once a day,

or once every two days, for a quarter of an hour or twenty minutes ('Practitioner,' November, 1868).

Dr. D. Brakenridge writes ('Med. Times and Gaz.,' June 13th, 1868) on the influence of digestive habit in tuberculosis. He points out that tuberculous subjects habitually reject fat, and that this, as in the form of cod-liver oil, is about the best remedy we possess for the disease. He alludes to the fact that inhabitants of warm climates also habitually reject fat food, whilst it is greedily sought by dwellers in cold climates. He accordingly suggests that, instead of sending tuberculous subjects to warm climates, we should rather, at least in the earlier stages of the complaint, look for a cold, dry, breezy climate, where the habit of digesting fat would be strengthened.

Dr. Payne Cotton writes an interesting account ('Brit. Med. Journ.,' Oct. 24th, 1868) of certain cases of hæmoptysis arising from aneurism of the pulmonary artery. The first occurred in a male, æt. 20, the subject of rapid phthisis. Hæmoptysis to a moderate extent appeared early in the disease, but was easily controlled until within three days of his death, when it suddenly occurred to the extent of half a pint, and continued more or less until death resulted by exhaustion. The right lung was pale and emphysematous; the left small, dense, and studded with tubercle. A large excavation existed in the upper, and a smaller in the lower, lobe of the latter. In the anterior and inferior portion of the latter was a clot concealing a small aneurism, the size of two peas, and consisting of two portions, one of which only was ruptured. The second case occurred in a male, æt. 27, who was the subject of ordinary phthisis; he had had hæmoptysis early in the disease, but it had not returned for twelve months, when he suddenly coughed up nearly two pints of blood; this hæmoptysis went on for five days, when he sank. Both lungs were tuberculous. In the upper lobe of the left lung were three vomicæ, in the lowest of which was an aneurism the size of a walnut, the vessel being as big as a crow-quill. In the wall was a ragged opening, and the cavity was lined by fibrinous laminæ.

The third also occurred in a male, æt. 15; he had been ill nearly two years and had never spat blood until one day, when he brought up 20 oz. He continued to spit more or less blood after this till his death, ten weeks after. There were two cavities in the apex of the left lung, the smaller of which contained a flaccid bag, with thin and friable walls; this was a dilatation of a large branch of the pulmonary artery—in fact, one of its primary branches. The aneurism contained no fibrinous deposit, and only a small coagulum. It was ruptured at its upper part. In these cases the artery, after losing the support of the lung substance, instead of running along the wall or ceasing abruptly, remained passive, and became distended into an aneurismal pouch. Dr. Cotton thinks that such conditions are far from unfrequent, in which he is confirmed by other authorities.

Dr. C. J. B. Williams and his son, Dr. T. Williams, communicated to the 'Lancet,' Aug. 1868, a series of papers on pulmonary consumption as seen in private practice. Dr. Williams thinks the chances of a phthisical patient are much better now than formerly, chiefly, he holds, owing to the introduction and improvement of cod-liver oil. He holds that the treat-

ment of the disease ought to be in every way restorative, should include nutritious food, the judicious use of stimulants and medicinal tonics, gentle exercise in pure air, bright sunshine and agreable scenery, with pleasant society. When, however, the disease is ushered in by acute bronchitis or pneumonia, the treatment should rather be medicinally antiphlogistic, including salines, with or without antimony, blisters and cataplasms, and sometimes even leeching and cupping; afterwards the sustaining plan should be adopted. When there is active inflammation and continued heat of skin, hard racking cough (dry or with viscid tinged expectoration), it answers well to withhold or withdraw the stronger stimulants and tonics, it may be for a few days only, to substitute cooling remedies and local antiphlogistic applications. This, however, should cease as soon as possible, and be replaced by the more common and strengthening plan of treatment. The author generally combines the use of cod-liver oil and medicinal tonics, and these, he says, may be exhibited long before the inflammatory complication has subsided. They may be given in the morning and early portion of the day, whilst the saline may be given during the evening and at night, counter-irritants being also used. When the nocturnal heat of the skin subsides, the cough becomes less frequent, and the urine more free, the saline may be replaced by a cough mixture if this be needed, the counter-irritation moderated, and the tonic, given with the oil, gradually strengthened by adding to it a little salicine, quinine, or iron. Dr. Williams thinks the last two remedies especially useful, but require care in their administration, as they often increase the lingering intercurrent inflammations, with their attendant pain, constriction, cough, and viscid expectoration. Not unfrequently they disorder the stomach and bowels. It is therefore better, when the patient cannot be seen frequently, to rely on mild bitters like calumba, cascarilla, or chiretta, which may be used along with the oil for weeks or months. Still, the great remedy is cod-liver oil, which, when taken into the system in sufficient quantity and for a sufficient length of time, acts as a nutrient, not only adding to the fat of the body, but also promoting healthy growth of other tissues, and obviating any tendency to degenerative changes. The best time for the administration of cod-liver oil is just after, at, or before a solid meal, when it is least likely to give rise to eructations. Also, as the oil must be given for months or years, both palate and stomach should be conciliated by the oil being exhibited in an agreable vehicle. For this purpose an aromatic bitter, or compound infusion of orange-peel acidulated with a mineral acid, syrup may be added if desired, or, still better, some bitter tincture, whilst in some cases strychnine in small doses would seem to be of great advantage. The bulk of oil given as a dose should be small, so that it may be swallowed at a single draught; a teaspoonful is quite enough at first, and the amount given should never exceed a tablespoonful, more being liable to derange the bowels and do actual harm. The acid may also be varied; in inflammatory cases the nitric suits best. Where there is a liability to hæmoptysis, sweats, or diarrhœa, sulphuric acid is preferable; but for long continuance Dr. Williams recommends phosphoric acid. The diet also frequently requires attention, the richness of the oil requiring that the food should

be less so than before its use; pastry, fat meat, rich stuffing and the like, should be avoided, and cream should not be used in excess. Even new milk may not be borne well. Many find malt liquors along with the oil too heavy. The diet should therefore be plain and nutritious, consisting of bread, fresh meat, poultry, game, a fair proportion of vegetables, and a little fruit; the quantity of liquid with the earlier meals should be moderate. Should a bilious attack, with nausea, headache, furred tongue, and high-coloured urine, come on, the oil is to be stopped, the diet lightened, a little blue pill or calomel given every other day along with an effervescent saline two or three times a day. This ordinarily speedily mends matters, but the oil should be given when first resumed in small doses. In all cases the bowels should be well attended to. Dr. Williams believes that, although cod-liver oil is the great remedy, other things may do some good in consumption, especially iodine and nitric acid, as well as in certain cases the hypophosphites. So, also, are certain substances when inhaled, as carbolic acid, iodine, chloroform, turpentine, and hemlock. But than all these change of air is far more important; a warm dry air is to be selected.

Dr. B. Foster ('British Medical Journal,' Aug. 8, 1868) reports in favour of using ether along with cod-liver oil as well as separately in the treatment of phthisis. This he does with the intention of stimulating the pancreas, Claude-Bernard having shown that ether was useful in this way. This secretion, according to Dr. Foster, is at fault in phthisis, and as ether is the best means for stimulating its secretory gland he gives this, with, he says, very good results. The weight of the patients increased in a majority of instances under the use of the ether, especially when given along with the cod-liver oil.

Gintrac, of Bordeaux, narrates in the 'Journ. de Bourd.,' Aug. 1867, p. 422, a case of so-called syphilitic phthisis; he gives the following diagnostics:—Syphilitic gummata generally occur in one lung only, and generally in the lower portion of the upper lobes; they remain closely circumscribed, they give rise to no hæmoptysis, and do not cause wasting or fever. In this Gintrac is not borne out by other observers.

Pneumothorax.

At a meeting of the Royal Medical and Chirurgical Society, held April 28, 1868, Dr. Douglas Powell read a paper on "Tubercular Pneumothorax." He maintained that in phthisis there was a constant tendency to this complication, which, however, was usually obviated by the adhesions produced by pleurisy. The opening is generally the result of the breaking down of tubercular material, but sometimes also would seem to be found as a sinus or from dead bone. The dyspnœa of pneumothorax resembles cardiac rather than pulmonary dyspnœa. The most important physical signs are hyper-resonance and displacement of the heart to the unaffected side. The air pressure on the lung acts as a certain impediment to the passage of the blood through its tissues. In fact, death may follow from this cause or from exhaustion.

Pyopneumothorax without perforation.—Boisseau, Professor at the Val de Grace, publishes in the 'Archives Générales de Médecine' for July, 1867, and succeeding months, a series of interesting observations

on the subject of pneumothorax without perforation as a complication of pleuritic effusions. The existence of such a condition has frequently been denied, but M. Boisseau's observations would seem to put its existence out of question. The first case recorded is that of a little girl, æt. 10, who, whilst sick of typhoid, was seized with pleurisy; when examined she exhibited signs of effusion, with air in the upper portion of the chest. She sank in three days. No orifice could be discovered in the lung. In another, also occurring in a little girl of 10, similar phenomena were observed. These had been recorded by Maréchal. Another, occurring in a young man, æt. 24, is recorded by Faussier, but this is not so certain as the others. A case recorded by Herard in 1850 is to a certain extent vitiated by the absence of certain signs of pneumothorax, or at least their non-detection during life; but another recorded by the same author is at least better in this respect. Several others are given by M. Boisseau of various value. One he records himself occurring in a civic guard, æt. 38, and appears as conclusive as possible, and another perhaps less so by M. Moutard-Martin. The objections raised against the existence of such a form of disease he enumerates as follows:—1st. The contact of air is indispensable for putrid decomposition and the formation of gases in such a cavity as those of the pleura. This is easily rebutted when we think of certain abscesses when opened. 2nd. The gas, which at the post-mortem examination escapes from the cavity of the thorax, may come from a perforation of the lung on opening the cavity. Such an objection cannot apply where the lung is forced far back by effusion, and where no opening whatever can be discovered. 3rd. The gas may be formed after death. To this it may be answered that its existence has been detected during life by means of more than one physical sign. 4th. In the cases where pneumothorax is cited as being without perforation an opening existed, but was not found. Against this can be urged the careful examination made, and the composition of the gas, which is very different from that in ordinary pneumothorax. 5th. In the cases narrated the signs of pneumothorax during life have not been incontestable. To this the only reply which can be given is—here are the signs: judge for yourselves. M. Boisseau enters into some details as to the symptomatology and diagnosis of the condition. The diagnosis rests between simple pleurisy with effusion, a large cavern, or pneumothorax with an opening. The metallic tinkling and the effects of succussion will distinguish pyopneumothorax from simple effusion. The gurgling will indicate the existence of a cavern. But it is more difficult to diagnose the presence or absence of a fistula. The history of the individual and of the malady is important. The sound which some hold is produced by the passage of air through the fistulous opening would, of course, be diagnostic. He also gives what he considers the therapeutic indications; of these he holds the first to be paracentesis, to void as much fluid as possible, but to use no injections at the close of the operation. The following are his formal conclusions: —(1) Pneumothorax without perforation, arising as a complication of pleuritic effusions, is rare, but its occurrence is incontestable. (2) The gases which give rise to it are the result of the putrefaction of the liquid effused. (3) It is possible to distinguish this form of pneumothorax

from that which arises from a broncho-pleural fistula. (4) The operation of thoracocentesis is indicated whenever we can be certain that there does not exist any communication between the pleura and the outer air.

Other papers on diseases of the respiratory organs are—

Eade, Dr. P., of Norwich, etiology of phthisis ('Brit. Med. Journ.,' Aug. 8, 1868). Paulicki, croupous bronchitis ('Wien. Med. Wochenschr.,' xvii, 86). Zierl, case of gangrenous lung ending in recovery ('Bayr. Aertztl. Intell. Bl.,' 7, 1868). Guillé, hydatid cyst of the lungs ('Arch. Gén. de Méd.,' ii, 1867, p. 739). L. Carleus, latent pneumonia ending in abscess (ibid., i, 1868, p. 94). W. Pirrie, hay asthma ('Med. Times and Gaz.,' July 6, 1867, et seq.). W. Burke Ryan, atelectasis pulmonia ('Med. Chir. Proc.;' 'Med. Times and Gaz.,' Aug. 24, 1867). Duncan Gibb, subglottic gouty disease ending in carcinoma ('Med. Chir. Soc.,' April 28, 1868). Morell Mackenzie, treatment of laryngeal growths with laryngoscope ('Med. Times and Gaz.,' June 18, 1868). G. Johnson, removal of a growth from larynx by the aid of the laryngoscope ('Med. Chir. Soc.,' May 26, 1868). R. P. Cotton, the hypophosphites in consumption. The author thinks they are of no benefit ('Med. Times and Gaz.,' Nov. 14, 1868). Clark and Marshall, hæmorrhagic phthisis (ibid., Dec. 26, 1868). Brown-Séquard, cure of two cases of croup by large doses of tartar emetic and local applications of alum ('L'Union Médicale,' i, 1867, p. 26). Sales-Giron, respiratory therapeutics (ibid., p. 563). Pidoux, fragments on the pneumonia, hæmoptysis, and fever of phthisis (ibid., ii, 1867, p. 285). Roberts, mechanism of the thorax, and its pathological results ('Edin. Med. Journ.,' Sept., 1867). Parsons, bronchitis in England and its causes (ibid.). Robert Thomson, pleurisy and hydrothorax, death by emphysema (ibid., June, 1868). Stone and Grabham, auscultation by the aid of musical vibrations ('Lancet,' Jan. 24, 1867). Greenhow, chronic bronchitis—lectures (ibid., Feb. 16, et seq., 1867). Wardell, empyema (ibid., May 18, 1867). Gregory, gouty bronchitis (ibid., Aug. 24, 1867). Budd, propagation of phthisis (ibid., Oct. 12, 1867). Cotton, propagation of phthisis (ibid., Nov. 2, 1867). Wade, sources of fallacy in the diagnosis of phthisis (ibid., Dec. 7, 1867). Buchanan, diagnosis and management of lung diseases in children—lectures ('Lancet,' Jan. 25, 1868). Dobell, true first stage of consumption ('Brit. Med. Journ.,' Feb. 23, 1867). Bishop, pleurisy, empyema, operation, recovery (ibid., May 11, 1867). Charlton, diagnosis and treatment of diseases of the chest (ibid., Aug. 24, 1867). J. H. Bennett, treatment of pulmonary consumption (ibid., Oct. 24, 1867). Popham, the alkaline treatment of pneumonia (ibid., Dec. 28, 1868). Walker, removal of foreign body from left bronchus. The body was a worn tracheotomy tube which had broken and slipped in; it was removed by a long pair of forceps (ibid., Feb. 15, 1868). Bird, pleuritic effusion (ibid., Feb. 29, 1868). Johnson, emphysema—lecture (ibid., June 27, 1868). Spender, capillary bronchitis (ibid., Sept 19, 1868). Banks, pleural effusion, thoracentesis. The author speaks highly of the operation, and recommends a drainage tube when the fluid is likely to collect again ('Dublin Quart. Journ.,' May, 1868). Scott Allison, morbid conditions of throat in relation to consumption ('Med. Press and Circ.,' July 1, 1868). Curran, cannabis indica in catarrhus senilis (ibid., Sept. 9, 1868). Saucerotte, digitalis in pneumonia ('Gaz. Méd. de Paris,' 1868, p. 667). Kiemann, pneumonia treated by veratrum viride ('Präg. Viertel.,' iii, 1868).

D. DISEASES OF THE CIRCULATORY SYSTEM.

Valvular Diseases.

M. Durosiez maintains that stenosis of the tricuspid valve is a more common disease than it is generally thought to be. He has himself observed 10 cases during life, and verified the diagnosis in all by post-mortem examination. Of these patients, 9 were between the ages of 22 and 58, the other was aged 60; the latter case was somewhat special, as there was no disease of any other valve but the tricuspid. There

was no antecedent rheumatism; the symptoms lasted two or three years. There was extreme dyspnœa, venous pulse, and a systolic bruit loudest at the top of the sternum. The post-mortem showed great contraction of the tricuspid orifice, and very probable insufficiency. Of the 10 patients 8 were women. In 3 cases there was a history of previous acute rheumatism; in 3 others a history of chronic general pains; in 2 more there had been repeated attacks of catarrh. Of the remaining 2 there is no historical record. In 2 of the above cases (not further specified) the symptoms had existed ever since infancy. In 5 the stenosis was of such degree that two fingers only could be passed through the orifice; where there was stenosis and insufficiency of the tricuspid there was always a high degree of the same condition in the mitral, and in one case aortic insufficiency also. In 2 cases only *one* finger could be passed through the tricuspid; in 1 of these, besides contraction and incompetence of the tricuspid, there were similar affections of the mitral and aortic valves; in the other, stenosis of the tricuspid and mitral with incompetence of the aortic valves. In 2 cases the tricuspid orifice was so narrowed that even *one* finger could not pass.

Durosiez inclines to think that the accidents which are produced by mitral contraction and incompetence are not aggravated by the simultaneous presence of similar affections of the tricuspid valve. The venous pulse, which Gendrin, more particularly, has brought into notice, appears to Durosiez, from his own experience, not to possess a true pathognomic significance of tricuspid contraction ('Gaz. des Hôpitaux,' lxxviii, 1868).

Dr. Blix ('Hygiea,' 9 and 10, 1867; 'Schmidt,' 10, 1868) records a couple of cases of endocarditis of the tricuspid valve, which, considering the rarity of this diseased condition, are worth mentioning. The first occurred in a woman, æt. 56, who was received into the Seraphim Hospital for a pneumonia of the right lung. When she entered the heart-sounds were clear but weak, no bruit was heard over the tricuspid, and the pulse was very small and almost intermittent. After death the heart was found to be fatty, the muscular tissue of the ventricles was yellowish. The aortic valves showed slight signs of fatty degeneration, the mitral and pulmonary were sound. The tricuspid showed signs of ulcerative endocarditis under the posterior division of the valve. The right anterior and the left posterior divisions were united by a fibrinous mass, firm and hard. One of the papillary muscles exhibited loss of substance. The endocardium itself was thickened, and covered with small pieces of fibrin. The lungs were œdematous, and the kidneys enlarged.

The second case occurred in a woman, æt. 31, who in her last pregnancy had lost much blood from placenta prævia, and who had consequently become extremely anæmic and weak. Latterly she had suffered from rigors, followed by profuse perspirations. There was slight dulness in one lung; the area of dulness over the heart was normal; but on auscultation alike over base and apex a loud systolic murmur was audible. Over the vessels in the throat an anæmic murmur was heard. The pulse was small and quick. The liver was much enlarged. She was much troubled with rigors, recurring at certain periods;

during one of these she brought up bright, frothy blood, and bloody sputa were brought up for some days, but afterwards ceased. Without any manifest change, she was one morning suddenly seized with dyspnœa and palpitations. She became livid and covered with a cold sweat; she had rattling in the throat, and speedily died. The lungs were found to be tolerably healthy, but the pulmonary artery was filled with fibrinous clots, as were all its branches. The heart was of the ordinary size, its walls somewhat fatty. The mitral, aortic, and pulmonary valves were healthy. The right anterior portion of the tricuspid valve was somewhat thickened, rough, and uneven on its outer surface; on its inner was a mass of firm and hard greyish-white fibrin, adhering firmly to the thickened portion of the valve; some of its cordæ tendineæ were also thickened; the posterior valve was normal at one side, but on that touching the right anterior there was a decided loss of substance. The liver was enlarged, partly gorged, partly fatty. The spleen, alimentary canal, and kidneys were normal. The uterine veins contained thrombi, as did the iliacs, the hypogastrics, and the aorta.

Dr. Peacock gives ('Lancet,' Feb. 29, 1868) two interesting cases of heart disease. The one occurred in a milkman, æt. 41, who had a history of rheumatism. When admitted his lips were purple, and there was general icteroid staining; the liver was enlarged, as was the heart, transversely. There was a systolic murmur at the apex, propagated towards the left axilla, and heard behind; there was also a basic murmur following the other. After death one of the cordæ tendineæ was found broken from the mitral valve, and to be covered with vegetations. The auriculo-ventricular orifice was also narrowed. There had been a slight vibratile thrill over the apex.

The second occurred in a youth, æt. 26, who had also suffered from rheumatic fever. He came in anasarcous. His face was tumid, his cheeks flushed, and his lips purple. The resonance of his chest was impaired. There were both systolic and diastolic murmurs, the former most audible over the fourth left cartilage, where it was followed by a ringing sound; at the base this second sound was followed by a soft murmur. At the apex the systolic was followed by a loud diastolic sound, but no murmur. The liver was large, and the abdomen tumid; his urine was never albuminous. After death the heart weighed 28 oz. The aortic valves were opaque, and one was much thickened. Immediately above was an aneurismal dilatation of the aorta the size of an egg; this protruded into the pericardium, and pressed on the right ventricle so as to partially obstruct the pulmonary artery, and partially destroy the valves. At this point there was a small opening into the aneurism.

The former case, owing to the great size of the liver, was treated chiefly by mercurials, but with little advantage; they were then laid aside. In the second, contrary to Dr. Peacock's usual plan in aortic incompetency, digitalis was given. Acupuncture of the lower extremities was also resorted to.

Presystolic bruit.—Dr. Peacock, in a paper read before the Hunterian Society, and Dr. Gairdner, in a lecture published in the 'Glasgow Medical Journal,' July and Dec. 1867, contend for the existence and value of

this sign of mitral obstructive disease. Dr. Peacock, who formerly opposed the notion of its existence, holds that the bruit might exist either by itself or conjoined with a mitral regurgitant murmur. In the latter case he thinks it might be difficult to make out the existence of the obstruction except by the fact that more work is thrown on the right ventricle, whilst the left, being imperfectly filled, renders the pulse small and quick, but regular. As the disease comes on more gradually than regurgitation, the pulmonary capillaries have time to distend, hence the dyspnœa is less. There is less general congestion, less dropsy, and the face is paler. The prognosis is better than in mitral regurgitation. Chalybeates and other tonics should be given to strengthen the action of the weak auricle, whereas in mitral regurgitation, the urgency being greater, diuretics and cathartics have generally to be employed. Dr. Gairdner also thinks that the presystolic bruit is of much better omen than a systolic mitral bruit, chiefly, he thinks, because the filling of the ventricle is a slow process and may extend over the whole period of the pause. Sometimes, indeed, the whole of this is occupied with a bruit, and yet the patient may appear not much worse. The ventricle is therefore generally pretty well filled, and rarely becomes atrophied. Dr. Gairdner is even inclined to believe that obstruction of the mitral is an advantage when there is also regurgitation, such cases proving less rapidly fatal than where there is regurgitation alone.

In such cases as those above alluded to Dr. Clifford Allbutt strongly recommends the *Prunus Virginiana* (lecture 'Med. Times and Gaz.,' i, 1867, p. 141 et seq.). It is also useful in other forms of heart affection, especially when there is much irritability of the organ.

Dr. Simpson, of Manchester, gives an account ('Brit. Med. Journ.,' May 16, 1868) of some cases of presystolic bruit. The first occurred in a woman who had much cardiac distress. She presented a harsh systolic apical bruit. Another case was more doubtful, as the heart's action was more tumultuous. A third occurred in a rheumatic subject. She presented a double murmur, one clearly preceding the first sound. In each instance the diagnosis was verified by a post-mortem examination. The same gentleman, in another contribution to the same journal (Aug. 15, 1868), describes a case of aortic regurgitation from mechanical injury to the valves. The patient, a man, æt. 40, was, four years before, helping to carry a piano downstairs when he felt something give way in his chest and immediately heard a noise proceeding from his chest, which he likened to that of a young frog. It was audible to others as well as himself for about nine months, during which time it gradually became weaker; he felt no pain or faintness at the time, nor had he any inconvenience for two years till he began to be troubled with tightness of the chest and palpitations. When admitted he was dropsical, the pulse was typically regurgitant and was visible in the dorsal arteries of the lower extremity; the first sound was weak, but was not complicated with any bruit; the second was superseded by a remarkably loud bruit, audible from the head to the lumbar region. In a few days his lungs were filled with blood and the expectoration became hæmorrhagic, and a good deal of fluid was effused into the various cavities. He died suddenly. A good deal of fluid was found in the pleura, peritoneum, and

pericardium, and the lungs were œdematous and contained apoplectic clots. The heart was large, its cavity dilated, the aorta was slightly dilated, the valves thick, leathery, and shrunken; two originated at the ordinary level, another nearly a quarter of an inch lower down. This stripping down of the attachment of the valve allowed marked incompetency. The mitral valves were quite healthy.

Dr. Hayden gives ('Brit. Med. Journ.,' Nov. 16, 1867) five cases of non-organic mitral regurgitant murmurs resulting from anæmia, purpura, masturbation, and excess in tobacco smoking. He arrives at the following conclusions:—(1) Regurgitation may take place at the mitral orifice, independently of disease of the valves or of dilatation of the orifice or of the ventricle. (2) The murmur which announces this form of regurgitation is faint and abbreviated, usually confined to the area of the apex, and not associated with embarrassment of respiration, vascular turgescence, or the other usual signs of organic mitral regurgitation. (3) The pulse associated with this murmur is quick, abrupt, and feeble, and either rhythmically irregular or of the alternately ascending and descending kind.

Dr. Cuming ('Dub. Quart. Journ.,' May, 1868) reports an interesting case of mitral regurgitant murmur where there was no diseased condition of valves. The case occurred in the person of a woman, æt. 33, married, and the mother of three children. During her last pregnancy she had been greatly frightened, but she did not miscarry. Nevertheless, from that time she suffered from palpitation, and soon after her confinement her limbs began to swell. When admitted to hospital she was anasarcous and anæmic, but there was no albumen in the urine. There was a loud systolic murmur heard at the apex and at the inferior angle of the scapula; there was no diastolic murmur nor anything to be heard in the line of the vessels. The jugulars were enlarged, but did not pulsate. The dropsy had frequently to be relieved by puncturing, and she ultimately died in the hospital. When the heart was examined nothing abnormal whatever could be discovered; the mitral valves were quite healthy, except a very slight thickening near the free edges of the anterior division. This, it was universally agreed by the medical men who examined the specimen, was not enough to cause the well-marked sounds they had heard. The opening was normal in size, the cavities were not enlarged or altered in shape, the muscular structure was unaltered, and the columnæ carneæ were well developed, firm, and in every way normal. The bruit could not therefore be accounted for on the supposition that the cavity was dilated, the muscular papillæ atrophied, and that so regurgitation had been permitted. Dr. Cuming therefore inclined to refer it to a nervous origin, connecting it with her fright. A point of greater importance is the occurrence here of both pulmonary and general œdema, in which respect the case goes against the doctrine laid down by Hayden; the absence of pulmonary engorgement is a special point in the diagnosis of non-organic mitral murmurs. Dr. Cuming also records another case of temporary mitral regurgitant murmur occurring in a gentleman who was labouring under exhaustion.

Gangrene of the heart, &c.—Prof. Young, of Cincinnati, gives, in the

'Medical Repertory' published in that city (May, 1868), some account of one of these unusual and interesting cases. The patient was an Irishman, æt. 65, and was admitted into hospital for chronic rheumatism. No heart mischief was discoverable, and his general health was good. About the middle of January, 1860, he injured his right thumb, aad a few days after the bone necrosed and had to be removed. Two days after the operation he complained of pain in the chest and head. Next morning his skin was hot, his tongue furred, his pulse rapid, he had a burning pain in his chest, and his breathing was difficult. The action of the heart was regular, but peculiarly soft. He gradually got worse, and two days after he became, during the night, extremely restless, his lips became blue, his face aud neck turgid, and the dyspnœa was urgent. He sank gradually; all this time the heart's action was regular and no abnormal sound could be detected.

Seven hours after death, whilst the body was still slightly warm, the post-mortem examination was made. The pericardium was very dark and distended with a fetid gas, which escaped when the cavity was opened. The cavity contained about 2 oz. of a dark-coloured fetid fluid, of the consistence of treacle. The heart was dark, almost black, in the right auricle. On attempting to raise it the fingers penetrated its tissue. The colour, which was mostly black or greenish-black, became lighter near the apex. The wall of the auricle was extremely fragile, as if it would fall to pieces. The whole tissue of the right side was softer than natural. The remaining portions of the heart were quite healthy. Dr. Young insists on the gangrenous odour as strong evidence in the proof of his notion as to this being true gangrene. Unfortunately we have no description of the microscopic appearances.

Bricheteau publishes in 'l'Union Médicale,' i, 1867, p. 101, a very interesting case of latent cancer of the heart and ovaries. The patient, a girl, æt. 24, came into La Charité on the 21st Nov. 1866, complaining of a slight cold. On examination there was found slight pleuro-pneumonia of the left lung, which, however, appeared to be in the way of healing. She had always menstruated regularly; for the last three months not quite as abundantly as before. When her chest was examined she directed attention to a swelling in the abdomen on the right side; with the period of its first appearance she was unacquainted. This tumour was hard and of irregular shape and consistence; it was readily movable, and was not connected with the uterus. It was painful on pressure; its size that of a fœtal head. She had menstruated five days before entering the hospital. She went on all right for eight days, when suddenly her pulse rose to 156 and 160; the sphygmographic tracing showing a series of curves without any line of ascent. Still the heart sounds were normal, and the patient only complained of a feeling of weakness and oppression. She had no palpitation. On the morning of Dec. 6 she seemed better; her pulse had fallen to 140. Two hours after the visit she was trying to reach a morsel of sugar from the stand by her bedside when she fell back and expired. On opening the thorax many pleuritic adhesions were discovered. The pericardium contained a little serum, and the enlarged heart rested in it perpendicularly. The left ventricle was yellowish in colour and presented numerous irregu-

larities of surface. Its muscular fibres were almost completely destroyed, and replaced by irregular yellowish masses, firm, and projecting on the surface. These masses gave, on scraping, a yellowish juice like those of cancer. They extended into the posterior part of the right ventricle and into the right auricle, as well as into the inter-ventricular septum. The anterior portion of the right ventricle was healthy. In the interior of the left ventricle were many vegetations, smooth and rounded. The valves, cords, and papillary muscles were healthy. The right ovary appeared as a whitish mass of considerable weight and consistence. Its shape was ellipsoidal and its surface irregular. The left ovary was much smaller, but resembled the other in appearance. The other organs were healthy. The microscopical examination was made by Cornil. The masses were shown to be cancerous, and the muscular tissue of the heart was fatty where not replaced by cancer.

The case of Dr. Ray, of Dulwich ('Brit. Med. Journ.,' March 7, 1868), is of interest. For many years he had been the subject of loud cardiac bruit, but had suffered little or no inconvenience from it; it was infra-mammary ,and had been variously described by different physicians. His last illness began with chills, nausea and vomiting, weakness, and general malaise. He thought he was going to have fever. A fortnight after this attack he had occasional chills—followed by drenching acid sweats, slow pulse, a furred tongue, a sallow dusky hue, pain over the region of the liver, and complete absence of bile in the motions. By the fourth week it was evident that he was suffering from pyæmia, and it was supposed that he was the subject of pylophlebitis. The rigors all through were so marked as to induce in Dr. Ray at one time a belief in the existence of ague. The patient became more and more prostrate; there was difficulty of breathing, with expectoration tinged with blood. He finally died after two months' illness. The spleen and kidneys contained embolic infarctions, the spleen being partially softened. The heart was large, and its valves, with one exception, healthy. In the mitral aperture was a projection from the posterior curtain about the size of a walnut, and a quantity of softening fibrin and clot were attached to its summit. This was a sac formed in the valve, which had an orifice at the apex and a recent rent, on whose edge was the disintegrated blood and fibrine. The sac had, in all probability, produced the bruit, and its rupture had given rise to the fatal termination by causing disorganization of the fibrin and poisoning of the blood.

Finck ('Presse Méd.,' xx, 28, 1868) gives an account of a case of ulcerative endocarditis occurring in a girl, æt. 13, who had suffered long from diseased knee-joint from which pus was discharged by a fistulous opening. Amputation was resorted to, and in four weeks the stump was healed; in two weeks more the child showed signs of general œdema, there was a slight systolic bruit, and difficulty of breathing followed; gangrenous erysipelas of the left thigh succeeded, which in its turn left a sore which bled at the least touch when it left off producing pus. This ended with rigors, semi-consciousness, and slight jaundice, and the child died. The lungs were found sound, the lower part of the left congested; the liver yellow, in a condition of rapid fatty degeneration. The kidneys were congested and enlarged. All the cavities of the heart

were healthy except the left ventricle; there, on the anterior and posterior walls, were found two ulcers resting on the thick walls of the ventricle, their surfaces covered with a kind of detritus.

Irritable Heart, &c.

Professor Maclean, of Netley, in a lecture on disease of the heart in our army ('Brit. Med. Journ.,' Feb. 16, 1867), points out the great frequency of *irritable heart* without valvular disease, and associates it with *milk spots* on the heart, the so-called "soldier's spot." There is in these cases hypertrophy without valvular disease, at first at least. He then points out the awkward and unnecessary way the weights the soldier has to carry are distributed so as to press on the axillary arteries and on the chest generally, and insists on the necessity of altering the soldiers' accoutrements.

Dr. Douglas records an interesting case in the 'Edin. Med. Journ.,' April, 1868. The patient was a remarkably powerful man, æt. 35, who, when seen, appeared to be in a very bad state. There was constant breathlessness and cough, the patient could not lie down, his skin was straw-coloured, his urine scanty and high coloured. He had suffered from hæmoptysis. The impulse of the heart wanted distinctness, and appeared diffused and irritable, but strong, differing much from the radial pulse, which was 120 and weak. The action of the heart was regular and the sounds were natural, except that the first approached in character the second. From the time he was first seen his condition, notwithstanding certain temporary rallies, gradually got worse. His skin became more yellow, his urine more scanty, his breathing and cough more troublesome, there was marble-like coldness of the extremities and œdema of the legs. Nourishment was loathed, but stimulants, especially champagne, were craved for. He had considerable pain in the right hypogastrium, but warmth applied to it invariably excited vomiting; ice seemed to relieve the latter. He could not sleep except sitting upright and bending slightly forward. Finally he died after a partially convulsive attack. On opening the left ventricle a rounded nodule was seen to project into it from the auricle, and when the latter was examined a soft cellular growth was found to originate from the posterior wall of the auricle, to nearly fill its cavity and project into the ventricle. It was $4\frac{1}{2}$ in. long, $2\frac{1}{2}$ in. broad, and $1\frac{1}{4}$ in. deep at its deepest part. It was covered by some layers of fibrin, but had a distinct structure of its own. Many of its cells resembled connective-tissue-corpuscles, but there were no cells which could be called distinctly cancerous.

Dr. Richardson ('Med. Times and Gaz.,' Jan. 4, 1868), speaking of intermittent pulse, says there are three kinds of irregular pulse—what he terms *acute irregularity*, where the pulse beats are in fours or fives, each series differing in time from each other; *prolonged irregularity*, where the pulsations during one minute or other period differ in rapidity from those during the next succeeding period; and, lastly, the most common variety, or *intermittent pulse*, associated with the feeling of palpitation, where one or more beats are left out, as it were, from the

regular sequence. The first of these is most common after loss of blood, the second with such affections as hydrocephalus; the third is not, says Dr. Richardson, as most people suppose, most frequently associated with heart disease. Dr. Richardson proceeds to inquire into the causation of the latter, and attributes it solely to non-contraction of the left ventricle during a certain period, in which the right continues to act and blood to be poured into the left great cavity. The latter then suddenly resumes work, but before the regular rhythm is again heard two diastolic sounds, indicative of two distinct periods of closure of the aortic and pulmonary valves (this depending on the accumulation of blood on the left side) succeed, and then everything goes on regularly until a similar paroxysm recurs. Dr. Richardson then proceeds to investigate the causes of the intermittency; he finds that it is not necessarily connected with heart disease nor with dyspepsia, but rather is of a cerebral origin, frequently following any strong emotion, and especially by the carrying to bed the worry of the day. Palpitation, says this author, is not due to spasm of the heart, but rather to a tremulous motion of the diaphragm, for palpitation may frequently occur when the pulse is slow. As remedies, good sound sleep is the best; watchfulness and care, feeling the pulse, and so on, is fatal to the patient's chance of recovery. In extreme forms opium is our sheet-anchor.

Prognosis of Heart Diseases.

Dr. Broadbent ('Brit. Med. Journ.,' Dec. 7, 1867) gives certain cases illustrative of prognosis in heart disease. The elements he lays down are—(1) The organic condition of the heart, as ascertained by physical signs. (2) The degree of impairment of its functional efficiency, as manifested by symptoms. (3) The general state of health and soundness of tissues and organs. (4) The presence or absence of conditions tending to aggravate the valvular or structural lesions in the heart or to precipitate the occurrence of complications.

Vascular Diseases.

Dr. Cuming relates a case in which the practical good effect of tracheotomy in the dyspnœa of aortic aneurism was strikingly shown. The dyspnœa was probably of double origin, from direct pressure on the trachea, and also from irritation of the left recurrent laryngeal nerve, when, from exertion or any other cause, the circulation was accelerated. The patient, who was dying from the interference with breathing, almost immediately received complete relief from dyspnœa, and never had any return of this up to the time of his death (from rupture of the aneurism into the trachea), nineteen days later. The case is remarkable for several other reasons, especially for some quasi-anginal symptoms, which probably depended on the interference of the tumour with the sympathetic and pneumogastric branches to the cardiac plexus ('Dublin Quarterly Journal,' May, 1868).

On Tuesday, June 25, 1867, Dr. Cockle read before the Royal Medical and Chirurgical Society a communication on the pathology of

aneurisms and other tumours occupying the root of the neck and upper part of the chest. The difficulty of diagnosing these tumours is considerable; sometimes it is difficult to tell whether the tumour is aneurismal or not, but more frequently to say which vessel is affected. The last is diagnosed by means of position, the condition of the circulation, &c. The paper showed some of the exceptions to the normal conditions; thus, aortic aneurism may ascend into the neck, and so give rise to symptoms similar to innominate or carotid aneurism. Of aneurism of the terminal portion of the innominate alone is diagnosis possible. If the thoracic organs are quite healthy, except close by the sterno-clavicular articulation—if a pulsating tumour occupy the space between the sterno-mastoids in the episternal notch—if the tumour in its ascent displace the clavicle and give rise to severe pain in the right shoulder, arm, neck, and head—if the pulsations in the right radial or carotid be comparatively weakened, pressure on one or the other diminishing the impulse in the sac—if a murmur of greater or less intensity be heard over the sterno-clavicular articulation and the sac, diminishing downwards but passing into the arteries of the neck and the axilla, if pervious, the murmur being absent on the left side—an aneurism of the terminal portion of the innominate artery may be diagnosed with tolerable certainty.

Aneurism of the pulmonary artery, &c.—Prof. Gilewsky, of Cracow, records in the 'Wien. Med. Wochenschr.,' xviii, 33—38, an interesting case of pulmonary aneurism. The subject, a man, æt. 28, had suffered from acute rheumatism, and soon after from heart disease. When admitted he was slightly cyanotic; he had right lateral curvature of the spine. The walls of the chest from the third to the sixth rib on the left side heaved with each systole. There were both mitral and tricuspid regurgitant and mitral obstructive murmurs, whilst there was also pulmonary insufficiency. The liver was greatly enlarged and painful. The urine was albuminous, and in the left side of the scrotum was a varicocele pulsating uniformly with the femoral artery. Sounds indicative of aneurism, aortic or pulmonary, could be heard over the chest. Three months after admission he died of acute bronchitis, the result of the approach of the aneurism to the left broncha. Inside the pericardium the pulmonary artery was much enlarged and sacculated, and its walls thickened. The orifice was enlarged and the valves altogether insufficient.

Dr. Roberts records ('Brit. Med. Journ.,' May 2, 1868) a case of aneurism of the ascending aorta communicating with the pulmonary artery. The patient had been ill about a month; he was pale and thin, and the lips were slightly livid, but there was no dropsy or œdema. He had an irritative cough, with occasional attacks of dyspnœa. By and by dropsy set in, and he had to take to bed, when his expectoration became tinged with blood. The præcordia bulged, and there was extreme cardiac dulness; a loud harsh murmur was heard over the middle of the sternum at the base of the heart, it was loudest at the upper margin, of cardiac dulness midway between the median line and left nipple-line. There was an intense vibratile thrill, but no heaving pulsation. The pulse was

markedly dicrotic by the sphygmograph. The patient died exhausted. The pericardium was adherent throughout, and the greatly enlarged heart was gorged with blood. The right aorta was greatly dilated, but a blunt-looking body was found to project half an inch into the pulmonary artery just over the valves; in the centre of this was an opening with thin edges; other smaller openings, also with thin edges, existed. The left ventricle was enormously dilated and hypertrophied. The aorta was dilated, and from it sprang a wide-mouthed aneurismal pouch communicating, as shown above, with the pulmonary. The aorta was atheromatous. Such cases are rare, and the opening generally occurs suddenly.

Dr. Wade records ('Brit. Med. Journ.,' Jan. 4, 1868) a case of abdominal aneurism of very great size, in which the pulse was dicrotic to the feel, tricrotic to the sphygmograph. The aneurism itself only presented one impulse, but two murmurs. He attributes the secondary impulse to the recoil of the aneurism.

Dr. Richardson ('Med. Times and Gaz.,' Oct. 17, 1868) writes on non-aneurismal arterial murmurs. He shows that these are common, especially in the subclavian at the apex of the lung. The cause he assigns to arterial murmur is chiefly resistance to the current of the blood. This may and does occur in healthy individuals—in fact, in many people, handicraftsmen, who use their arms much, especially carpenters. The cause in this instance is the subclavius muscle strongly developed. Again, it may be produced by osseous arteries; and, thirdly, by feeble muscular power of the arterial coats when the vessel passes close to or through a bone. To diagnose this kind of murmur it is generally enough to move the limb on the affected side, so as to afford freer passage to the blood, and the murmur ceases. Another point is that the murmur is not constant, but comes and goes.

M. Dieulafoy ('l'Union Méd.,' iii, 1867, p. 218) records an interesting case of tricuspid and mitral insufficiency without any murmur. The patient, a male, æt. 60, entered St. Antoine, under Jaccoud. When seen he was sitting up, his lips blue, his eyes injected, his jugulars pulsating, his hands cold and perspiring. He had suffered from bronchitis for many years. Still there were no cardiac bruits. There was nevertheless evident tricuspid regurgitation, as was shown by making the patient cough, when venous pulsation in the neck was greatly exaggerated. The urine was slightly albuminous. The man soon died of dyspnœa. The arterial orifices of the heart were found to be sound; but the auriculo-ventricular (especially that on the right) so dilated that there seemed no line of demarcation between auricle and ventricle. The great size of these openings doubtless accounted for the absence of bruit.

In the April number of the 'Edin. Med. Journal,' 1868, Mr. Benjamin Bell records the case of a man, æt. 42, who, while undergoing no particular exertion, suddenly fell down and became insensible. Medical aid was summoned, but nothing could be done. There was great breathlessness and jactitation, and, finally, the pupils were very widely dilated. He died *one hour* after the seizure. On examining the body it was found that the pericardium was filled with blood. The heart was large,

but healthy; but the aorta was extremely atheromatous, with cracks and fissures of the bony plates in every direction. No orifice by which the blood might have escaped could be discovered.

MM. Beaugrand and Kelsch ('Gaz. Méd. de Paris,' 1868, p. 283) recount an interesting case of rupture of the aorta. The subject was a soldier, who had just come off a long and trying march. He was suddenly seized with general malaise, cold, and sinking; taken to the hospital, he vomited a great deal of greenish material, and his bowels were relaxed. Thinking he had been seized with malarious fever, quinine in large doses was administered. His pulse was quick, the action of the heart feeble, but regular and normal; this gradually diminished in force, the patient becoming cold and livid; finally, he sunk. On opening the pericardium a great quantity of serum and clotted blood was found. The heart was sound, but the surface of the aorta presented several little nipple-like projections. When the vessel was opened these were found to correspond to little indentations in the wall, occasioned by slight deficiency in the central coats of the vessel, for the inner one was entire, except in the case of the largest depression, where existed a small hole, with difficulty discovered, and not larger than a pin. Through this—for no other opening existed—the blood had escaped. When the vessel was filled with water, none could be forced through the opening at first, as it contained a small clot.

Dr. W. S. Playfair ('Lancet,' July 20 et seq., 1867) writes on thrombosis of the pulmonary artery as a cause of death in the puerperal state. He tabulates in all 25 cases, and records two new ones. Dr. Playfair advocates the view that these are cases of thrombosis, not of embolism. That the latter comes on at a much later period after delivery (about 15 days). That the cause of the one coagulation most probably is similar to, if not identical with, that of the other. That both are most common in weak and anæmic people. That obstruction of the pulmonary sometimes occurs without being fatal, and that both thrombosis and embolism are more common in primiparæ than multiparæ.

Dr. Bourdon relates ('l'Union Médicale, i, 1867, p. 250) an interesting case of plugged iliacs, causing paralysis, and ending in gangrene of the lower extremities. The patient was a dressmaker, æt. 22, who had led rather a fast life, but had never been ill till recently, when she was seized with cholera in the country. Anxious to return home, she travelled a long distance, and that night was extremely breathless and coughed much, for after the cholera she had been seized with some affection of the lungs. Next day she was in much the same state, but the day following she was seized with coldness and extreme pain in the lower limbs, resembling that of cholera. They rubbed her legs, but they were flaccid, immovable, and insensible to friction. Next night she was much the same, only she perspired abundantly. The left leg was colder than the right, but she no longer complained of either. The right limb could hardly be moved, but it was quite warm, and the beats of the popliteal could be felt. Then gangrenous spots were discovered on its inner aspect. The left limb was movable only by the pelvic muscles; it was deadly cold, and of a violet colour; but there was no smell and no phlyctenæ. The arterial beats could not be felt. She

sank on the morning of the 9th, having entered on the 7th. The mitral valve was found lined with warty vegetations, in some parts connected by strings of fibrin, and having fibrinous clots adhering to them, one extending into the aorta. One of the aortic valves was covered with fibrin. Some vegetations also existed on the right side, and clots adhered to them also. The right iliac was completely obstructed by a clot extending into the hypogastric and external iliac. The central parts of the clot were apparently old. The left iliac artery was clear in its upper part; the hypogastric contained a clot, as also the external femoral and the lower portion of the iliac. The other parts of the body, with the exception of those alluded to, were healthy. Figures are also given, to which reference may be made.

The Treatment by Compressed Air in Dyspnœa, &c., from Impeded Circulation.

The treatment of various conditions of organic disease involving dyspnœa, by placing the patient in a chamber containing a *compressed atmosphere*, is steadily assuming an importance which must compel all practical physicians to study it carefully.

Dr. v. Vivenot records a series of observations, partly on healthy persons and partly on patients affected with chronic bronchitis and emphysema, which go far to place the mechanical theory of the action of compressed air on an assured basis. He examined the pulse, in all cases, with the sphygmograph of Marey, and obtained remarkably uniform and decisive results. In every experiment it was observed that the pulse-curves were rendered smaller under the action of the remedy, and that the "line of ascent" was more oblique. These facts, and a remarkable retardation of the pulse which is observed, prove indisputably that arterial tension is increased. And the conclusion thus formed was much strengthened by a check experiment on the effect of *diminishing* atmospheric pressure. The cases of dyspnœa in which the treatment is useful are just those in which the affection depends on dilated right heart, full venous system, impaired pulmonary circulation, and empty arteries, a condition very often existing in chronic bronchitis with emphysema. In these cases the feeble contraction of the left ventricle is due, not to defective heart power, but to diminished blood supply *à tergo*. The remedy, by helping the impletion of the left ventricle, affords immediate relief. The morbid condition which it is calculated to counteract is the immediate cause of death in a large number of cases—all those cases in which the mode of death is characterised by a gradually increasing dropsy, arising from venous congestion independently of organic disease of the kidneys.

Sanderson observes that experience teaches us that in such cases diuretics and purgatives are the best of our ordinary weapons, but such treatment is most unsatisfactory in principle. In order to relieve the venous congestion, and invigorate the heart, we have to tease the kidneys with calomel and digitalis, and the bowels with jalap and cream of tartar. The patient recovers; but there has been much needless tissue waste and loss of energy. Anything like a reasonable hope that we may replace these chemical remedies by a mechanical one ought

to direct our attention to the immediate construction of apparatus for the application of the compressed-air treatment in connection with all our hospitals ('Practitioner,' Oct. 1868).

From the Kranken-Anstalt of Neu-Schöneberg, at Berlin, we also receive decided testimony to the value of the compressed-air chamber in the treatment of cardiac affections attended with dropsy. The rapidity of the heart's action was diminished, and the dyspnœa mitigated in a very short time. The remedy was also employed in palpitation and dyspnœa of anæmic origin; it was found rapidly effective especially in those cases where stomach derangement prevented the use of iron ('Schmidt's Jahrb.,' 138, p. 118).

On placing patients in a closed chamber in which the pressure of the air was reduced from 30 to 20 inches, the pulse became remarkably affected, all the signs of a very considerably *diminished* arterial tension being produced; *e. g.* the pulse became more voluminous and more rapid, and the line of ascent of the pulse-curve became vertical, &c. Moreover, ophthalmoscopic investigation of the eyes of patients placed in compressed air plainly showed that the retinal vessels were constricted ('Virchow's Archiv,' xxxiv, p. 515).

Dr. Burdon-Sanderson, commenting on Vivenot's experiments, and relating his own experience of a visit to Reichenhall, in Bavaria, where the compressed-air cure is carried out with great completeness, observes that these physiological effects of the remedy appear to offer a new and precious resource in many cases of organic disease. He remarks that the influence of the treatment is to alter the fundamental distribution of the blood, diminishing the volume of blood in the veins and auricles, and consequently increasing the quantity contained in the ventricles and arteries. The diminished fulness of the venous system retards the filling of the ventricles during their period of relaxation, and so lengthens the diastolic interval, and slows the pulse.

Application of the Graphic Process to the Organs of Circulation.

Although no such striking additions to our knowledge of the graphic method as the great work of Wolff,* for instance, have been made within the years 1867-8, in some respects the progress accomplished has been more valuable than anything which had gone before. An *exactitude*, namely, has been introduced into the application of this mode of observation which has been fruitful in results that are of very great consequence. It must be allowed that some of these results are negative, or rather destructive, for they show that certain diagnostic advantages which have been expected from the method cannot be safely calculated upon. On the other hand, in the more limited field to which the graphic method seems now to be restricted, its indications will henceforward possess a much higher value.

In the first place, we may just mention the subject of cardiography, but only to dismiss it. In the 'Retrospect' for 1865-6 we had already noticed the objections which Onimus and Viry had raised to the correctness of the indications of Marey's cardiograph, on the score of

* 'Charakteristik des Arterienpulses;' analysed in the 'Retrospect' for 1865-6.

the complicated nature of the media through which the pulsations of the heart are conveyed to the writing lever. Those objections are, we think, just; but at any rate it seems to be the general opinion of those who have had any large experience of the graphic method, that (for purposes of *medical* examination, at least) the cardiagraph is not sufficiently reliable to be of practical value.

On the other hand, the sphygmograph of Marey has not only maintained its value in the opinion of all except those who expected impossible diagnostic miracles from it, but has received certain modifications which indefinitely increase its utility, by rendering its indications more precise.

In the last 'Retrospect' we mentioned the great benefit which had accrued from the employment of Mr. Berkeley Hill's pad, or cushion, by means of which application is rendered easier, and also far more certain of procuring the true pulse-curve. This modification fully maintains its value. On the other hand, attempts which have been made to simplify the instrument by essentially altering its principle have so far not succeeded. The application of weight pressure instead of spring pressure, of which we spoke with partial approval in our last report, has not been shown capable of being carried out without involving serious fallacies. There seems no mode of applying the weight *directly to the artery*, consistently with facility, accuracy, and solidity in the adjustment of the instrument to the arm. And it is certain that the method of suspending weights upon the writing lever itself involves important fallacies, for in this way the lever gains factitious velocity, and describes curves which are no real transcript of the movements of the arterial wall. Nothing hitherto devised can compare with Marey's sphygmograph, fastened to Berkeley Hill's pad, for the ease with which it can be so applied as to remain firmly in the position in which it is placed.

A still more important matter is the exact graduation of the force with which the tactile spring presses upon the artery. It was mentioned in our last report that Dr. Burdon-Sanderson had devised a means of *weakening* the spring of the sphygmograph in order to get the maximum curve from certain weak pulses, viz. the *extension of the spring* at its *free* end. Since that time he has applied the same principle to the exact measurement of the pressure exerted. In the original sphygmograph of Marey the only provision for regulating the pressure was the screw-button placed at the attached end of the spring; but this was inexact. Sanderson utilises this button for obtaining a standard of *maximum* pressure, to be subsequently modified as occasion may require. The instrument being fixed in a vice, the free end of the spring is looped by a wire to one end of a balance. In the opposite scale a weight is placed equal to the maximum pressure which we desire that the tactile spring shall be capable of exerting on the artery. In practice it is found that a pressure equal to 300 grammes is a sufficient maximum for the great majority of pulses, but Sanderson has lately found that for some exceptional pulses it is necessary to be able to exert a pressure of 450 grammes; it is therefore desirable to put that weight in the scale. The end of the spring is thus drawn up through

a certain distance, which must be measured, and then the central screw (which till now has been loose, and not pressing on the spring) is turned till the opposition of the weight in the scale is exactly overcome, as shown by the free end of the spring being *depressed* exactly to the same distance as it had been *raised*. The central screw is then fixed at this point. If, now, the instrument be simply strapped to the arm, and the free end of the spring made to bear on the artery, a maximum spring pressure of 450 grammes is exerted. For the great majority of pulses this is much too strong, and must be considerably reduced before we get the largest possible tracing. This is now accomplished by a screw apparatus at the wrist-end of the sphygmograph. By turning this screw we push the sphygmograph away till its spring ceases to touch the artery, and in order to make it touch again the *small* screw must be turned, which extends the free end of the spring. The degree to which the spring has been extended, by the time we have obtained (after repeated trials) the maximum pulse-tracing, is estimated by comparative measurements (in tenths of an inch) of the distance between the upper surface of the spring and the horizontal "pièce intermédiare," before and after the modification. If, *e.g.*, when the spring was exerting a pressure of 300 grammes this distance was $\frac{3}{10}$ inch, and in order to get the maximum pulse-curve it has been necessary to load the free end of the spring till the distance has increased to $\frac{6}{10}$ inch, the spring pressure has been reduced to 150 grammes, and so on.

Precisely the same subject had independently occupied the attention of Prof. Behier, of Paris, who is well known for his laborious and valuable clinical researches. M. Behier early perceived the necessity of making the pressure of the tactile spring an exactly measurable quantity, if reliable observations with the sphygmograph were to be carried out. Instead, however, of hitting upon Sanderson's plan, he devised the following apparatus. For the central screw of Marey's original instrument he substituted one which turns with a cruciform handle, moving a dial-plate marked in degrees. Instead of the *hinged* wings by which Marey's original sphygmograph was fitted to the arm he substituted solid *fixed* wings. The instrument being solidly fixed to the arm, the tactile spring does not touch the artery, but the central handle is turned till the spring just rests on the vessel, so that the lever is raised by its pulsations. During this adjustment the dial-plate has moved from zero up to a certain number; and now, to increase the pressure up to that point at which we get the largest tracing, the central screw is turned so as to depress the spring. The number of *grammes* finally marked on the dial, minus the number to which the dial had been turned before the spring could bear on the artery, indicates the actual pressure employed.

By either of these plans, Sanderson's or Behier's, we obtain advantages which are immediately appreciable by the practical sphygmographer. We possess a readily applicable and mechanically accurate gauge of that most difficult thing to estimate by touch—the *resisting power of the pulse*. The information which is thus afforded us as to the real *power of the heart* is greatly more accurate than we can obtain by either

auscultation or palpation; and it need hardly be said that under certain circumstances such information is priceless.

In a paper by Dr. Anstie ("Recent Improvements in Marey's Sphygmograph," 'Lancet,' June 10, 1868), instances are referred to in which patients in acute diseases (*e. g.* typhoid fever) had a pulse which to the touch revealed little or nothing, but which, under exactly graduated spring pressure, showed the force of the heart to be so poor as absolutely to require the use of wine, or so good as to render the prognosis favorable and wine unnecessary. Again, in ascertaining the presence and estimating the amount of cardiac hypertrophy, the graduated sphygmograph is sometimes invaluable. It is similarly useful, indeed quite indispensable, in all cases—such as aneurism—in which a comparison of the arterial pulses of opposite sides must be made.

The prognostic and therapeutic indications of the sphygmograph in acute diseases have been discussed by Anstie, in the paper just quoted, and also in his lectures at the College of Physicians ('Lancet,' 1867, ii). With regard especially to prognosis, the indications of the instrument are of great value. Not merely is much information afforded by observation of the amount of pressure required to obtain the maximum pulse-tracing, but various points in the formation of the pulse-wave are very important. Anstie confirms the general statements of Wolff as to the essential nature of the change of the pulse-wave in pyrexia, as to its secondary markings—viz. its change from the *tricrotism* of health to a *dicrotic* form; and as to the correspondence between the depth of the dicrotic notch and the severity of the pyrexia. He gives a different estimate from Wolff's, however, as to the temperatures with which the different degrees of dicrotism respectively correspond. And he insists much more strongly than Wolff on the fatal indications afforded by two particular forms of curve. (1) The doubly undulatory curve—*a small hyperdicrotic pulse-curve, with bluntly rounded apex, and with the general line of maximum and minimum pressure constantly and irregularly changing its elevation.* He shows that the fatal significance of this curve rests in the fact that it proves the propelling power of the ventricle varies from moment to moment; it is, in fact, a sign of extreme cardiac exhaustion, and not improbably of that kind of exhaustion which accompanies 'Zenkerism' of the cardiac muscular structures. Another trace which Anstie finds from a large experience (especially in fever) to be absolutely fatal in significance is *late in the disease*, when a *very small and rapid pulse produces a tracing in which the line of ascent is vertical and the apex sharp, but the line of descent is convex towards the line of ascent, and is entirely destitute of secondary markings.* Both of these fatal forms of pulse-curve have been frequently observed by the author. On the other hand, he draws attention to a *large* form of pulse-curve, devoid, or nearly devoid, of secondary markings, which occurs *early* in some acute diseases, which experience has shown to be of decidedly good omen.

A very important use of the sphygmograph, in the future, will probably be its employment as a test of the action of various remedies upon the circulation. Anstie shows in the above-quoted lectures that alcohol diminishes or heightens arterial tension accordingly as it acts as

a restorative or as a depressor of the general force. Prof. Behier confirms this general observation, and applies the observation of tension changes to the investigation of the effect of the acetate of *methylamine*, a substance generated in coffee during roasting, from the decomposition of *caffeine*. The research on this particular drug was executed by M. Personne, Pharmacien to the Hôp. de la Pitié, under M. Behier's superintendence. The result is to show a striking effect of the drug in raising arterial tension) 'Practitioner,' Oct. 1868). It seems reasonable to expect important results from the sphygmographic study of the action of remedies for acute diseases upon the vascular system. Some efforts have been made in this direction by Mr. Brunton ('Essay on Digitalis,' Churchill, 1868), with regard to the action of digitalis.

The latest novelty of any importance in sphygmography is the research, of Dr. Eulenburg, of Berlin, upon the pulse-form in diseases of the nervous centres. Eulenburg examined the radial, the tibial, and the carotid; also the ulnar, femoral, and the temporal, but these gave no useful tracings. (1) The radial, in *tabes dorsalis* of advanced grade, with extensive lesions of sensibility, gave constantly a dicrotous trace of pronounced type, indicating, in this case, *diminished arterial* tension, in other circumstances a *simultaneous increase of the force of the heart*. The diminished arterial tension is due to the involvement of certain sensory fibres in the posterior columns of the cord which are capable of exerting a reflex influence on the calibre of the arterioles. When the patient improves and the affection of these fibres vanishes, the dicrotous character of the pulse vanishes also. Eulenburg thinks the dicrotic character of the pulse is really diagnostic, and mentions a case where this test was usefully employed to distinguish between tabes dorsalis and disease of the *anterior* columns. (2) In recent cases of *apoplectic hemiplegia* in old people, Eulenburg examined the artery of the sound side; the pulse-form here was such that the first secondary wave reached or rose above the level of the primary apex. This pulse-form depends on diminished blood-pressure and diminished rapidity of the blood-current; it is developed out of the ordinary senile form in virtue of the lowered force of the heart. In older-standing cases of paralysis, when the heart's energy has recovered itself, the normal pulse-form reappears. Younger apoplectic subjects exhibit the ordinary pulse-form of their time of life.

On the other hand, the pulse-curve of the paralysed side approaches the simplest *monocrotous* type. This results from the fact that besides the diminished heart-force a local momentum operates, viz. the paresis of the vaso-motor nerves, and laxity and dilatation of the arterial walls. Certain other cases of chronic brain disease are also analogous to these in reference to the difference of the two pulses. The pulse-curve in puerperal paralysis and atrophies presents a similar form to that observed in hemiplegia.

The pulse of the tibial artery is *normally dicrotous* with feeble development of the first secondary wave. This depends on the low blood-pressure in arteries which are distant from the heart. In tabes, therefore, the dicrotic appearance of the tibial pulse-curve is much more marked than that of the radial curve.

The carotid pulse-curve is normally of great height; it has large secondary waves, and a marked *tricrotism* or even *tetracrotism*, in consequence of its greater nearness to the heart; it is much more affected by respiratory changes than the pulse-curves of other arteries. The alterations of the pulse-curves in tabes do not, as in many other diseases, depend on circulatory abnormalities originating from the heart, but on mere local changes in the vaso-motor nervous system. In cases which, as to symptoms, are classified under the so-called "tabes basalis" there was also a tendency to dicrotism. In cerebral paralysis, on the contrary, the curves show the same characters as those of the radial, both on the paralysed and on the sound side. The same conditions are also frequently found in old persons suffering from marasmus without brain disease, when the radial curve, nevertheless, presents no distinctly anacrotous character (*i. e.* the first secondary elevation as high or higher than the primary apex). This abnormality probably depends on the pathological changes in the walls of the arteries which are so common in such subjects ('Berlin. Klin. Wochensch.,' 28, 29, 1868).

Other papers on diseases of the circulatory organs :—

Colin, interstitial extravasation into the walls of the heart ('Gaz. des Hôp.,' 104, 1867). Fräntzel, on two peculiar phenomena resulting from insufficiency of the aortic valves ('Berlin. Klin. Wochenschr.,' iv, 44, 45, 1867). These were increased size of the liver previous to the appearance of dropsy, and a double sound in the femoral artery. C. J. Ermerins, aneurism of the ascending aorta into a lung cavern ('Nederl. Tijdschr.,' Aug. 1867). Degan, of Fürth, records, in the 'Arch. f. Klin. Med.,' iii, 6, p. 614, a case of persistent *isthmus aortæ* in the shape of a dense ring between the origin of the obliterated *ductus arteriosus* and the origin of the left subclavian. The aorta below this was dilated into a spindle-shaped cavity, and at last gave way, causing death. W. Pinling, aneurism of the abdominal aorta ('Wien. Med. Wochenschr.,' xvii, 94, 95). Cuq, rupture of the walls of the heart ('Arch. Gén. de Méd.,' ii, 1867, p. 74). N. Heckford, four cases of entry of air into the circulation ('Med. Times and Gaz.,' i, 1867, p. 137). A. Leared, disguised disease of the heart' (ibid., p. 695). Spencer Watson, aneurism of the left ventricle (ibid., ii, 1867, p. 32). A. Leared, on the heart sounds, Med. Soc. Lond. (ibid., p. 24). As is well known, Dr. Leared attributes these sounds to the impinging of the particles of blood against each other. W. Ilife, no tricuspid orifice (ibid., p. 456). J. Murray, false aneurism of the abdominal aorta (ibid., p. 647). Dr. Elliot, three cases of cyanosis ('Royal Med.-Chr. Proc.,' June 23, 1868). A. Leared, on blood sounds ('Med. Times and Gazette,' ii, 1868, p. 501). A. Poland, aneurism of the common carotid, &c. (ibid., p. 529). Duncan and Frazer, electrolysis in aneurism—the authors record one successful (cirsoid) and one unsuccessful case—('Edin. Med. Journ.,' Aug. 1867). A case in which a common sewing-needle caused death by hæmorrhage into the aorta ('Lancet,' i, 1867, p. 298). T. H. Fenn, fatty degeneration of the heart simulating ague (ibid., April 20, 1867). T. L. Brunton, nitrate of amyl in angina pectoris (ibid., July 27, 1867). Richardson, embolism of the right ventricle of the heart (ibid., Nov. 23, 1867). Johnson, retrograde engorgement of the blood-vessels (ibid., June 20, 1868). Leared, sounds of the heart in relation to pathology (ibid., Sept. 26 et seq., 1868). Philipson, aortic aneurism (ibid., Nov. 28, 1868). Shapter, notes on diseases of the lungs and heart ('Brit. Med. Journ.,' March 16, 1867). Cotton, case of unusually rapid action of the heart—232 per minute; the man was twice ill this way, and on both occasions got suddenly well—(ibid., June 1, 1867). J. O. Brown, case of unusually rapid action of the heart—192 per minute; death—(ibid., July 6, 1867). W. M. Whitmarsh, death from aneurism of the ovarian artery (ibid., Aug. 31, 1867). Dyce Brown, thrombosis of the heart (ibid., Dec. 19, 1868). Cuming, aneurism of the thoracic aorta—tracheotomy; death by rupture into the trachea—('Dub. Quart.,' May, 1868). Moore, thoracic aneurism with dementia (ibid.). Banks, mitral and aortic disease—embolism of the brain; hemiplegia — (Dubl. Quart.,' May, 1868). Liddell, internal aneurism as a cause of sudden death ('American Journ. of Med.,' Jan. 1867).

E. DISEASES OF THE ALIMENTARY CANAL, PERITONEUM, ETC.

Auscultation of the œsophagus is described and advocated by Dr. Hamburger ('Wien. Medizin. Jahrb.,' xv, 2, 1868). The paucity of means which we possess for diagnosing the existence and nature of œsophageal diseases makes it necessary for us to seek new resources. Of symptoms, there are but two which really point distinctively to the presence of disease of the œsophagus—viz. pain and dysphagia; and even these do not convey much information. The former of them is not often present, even if the disease be malignant, nor can we easily refer it to an exact situation when it does exist. Moreover, it occurs with far the greatest frequency in those diseases which, like hysteria, &c., are merely functional. As for dysphagia, this is even more unreliable as a symptom of œsophageal disease, and is, in fact, in the majority of instances, a merely reflex symptom of affections of more or less distinct organs, *e. g.* of tonsillitis, aortic aneurism, thyroid diseases, retro-pharyngeal abscess, cancer of lungs or pleura, diseases of the nerve-centres, &c. While, in such an organic affection as œsophageal dilatation dysphagia may be entirely absent.

Hitherto the only physical means for the exploration of the œsophagus is the use of the *sound;* but this is a dangerous instrument, able to inflict at least as much harm as good. No doubt, it is indispensable; but Hamburger maintains that its employment, to be safe, must be directed by the more precise information which œsophageal auscultation can afford us.

Every fluid and every solid swallowed produces in its passage down the gullet a certain sound, which may be detected by applying the stethoscope or ear to the skin. The cervical part of the tube may be auscultated on the left side of the neck, the thoracic portion at the left of the spine, the patient being made to swallow a table-spoonful of water, which is preferable to solids. The œsophagus should be examined in its whole length, from the hyoid bone to the eighth dorsal vertebra. In *health* the stethoscope applied near the hyoid bone detects a loud gurgle, and the ear receives a shock, as if water was forcibly thrown into it. The sound is due to the sudden compression of air and water in the œsophagus; it grows fainter as we examine lower and lower down the neck. Auscultation from the cricoid cartilage to the eighth dorsal vertebra detects the sound of a small spindle-shaped body, firmly enclosed and pushed downwards by the œsophagus. The impression of the *fusiform* shape of the swallowed mass is quite distinct, though inexplicable; and it is important, because we do not find it in certain diseased conditions. The ear also detects the circular contraction of the œsophagus, which is heightened when the descending body meets with any obstacle. The sound usually heard is that of smooth slipping, and occasionally of glugging; morbid deviations from it are easily recognised. The act of swallowing takes place within a short but measurable time, and the auscultator perceives that the morsel is carried

perpendicularly downwards. It is necessary to observe—(1) the *sound* of deglutition, (2) the shape of the morsel, (3) the energy of the contraction, (4) the rapidity with which deglutition is effected, and (5) the direction in which the morsel is propelled.

In *disease* the following points are to be noted:—(1) As to the sound, this is often quite absent—a fact which denotes serious alterations. If the sound is heard down to a certain point, and then suddenly ceases, we may safely conclude the existence of one of the following lesions—rupture of the œsophagus, foreign body, possibly a dilatation, or most frequently *stricture*. At the same time we learn the seat of lesion. A faint *friction* sound, added to the slipping sound, indicates diphtheritic processes (which may occur in the course of puerperal, typhoid, or exanthematic diseases), fibroid or polypoid excrescences, pustular eruptions in the œsophagus, large ulcerations with detached lower margin, or spasmodic dysphagia. A slightly *whistling* or *hissing* sound was heard in a case of rupture. A *rustling* sound is sometimes heard in pseudo-membranous processes, and ceases after vomiting. The ordinary murmur may be accompanied by a *metallic* sound in pneumothorax of the left lung. A *sputtering* and *running* noise replaces the normal sound in considerable dilatation and relaxation of the tube, in callous strictures when the muscular fibres are much compressed and atrophied, in paralysis, and in all those protracted catarrhs accompanying ulcers and new formations which cause relaxation of the muscular coat by serous imbibition. *Sonorous regurgitation* takes place in cases of recent stricture, especially in the spasmodic and paroxysmal form. A *scratching* sound may be artificially produced by the laryngeal probe, and, heard by the stethoscope, is of great importance in determining the exact seat of the affection. (2) Alterations in the shape of the morsel always occur when the contraction of the tube is *nil* or unenergetic, and when the shape of the œsophagus has become changed. (3) The energy of muscular contraction may be increased or diminished: the former occurs in impeded deglutition; the ear perceives a forcible contraction just above the seat of the impediment. Increased energy of contraction sometimes gives a feeling of jerk or blow to the ear when the morsel arrives at a certain spot; this points absolutely to an ulceration, erosion, pricking body, or otherwise inflamed part, though it is very difficult to localise this exactly. (4) *Rapidity* of deglutition is never increased; it is nearly always diminished. (5) Deviation of the morsel *to one side* is rare; it may happen when disease of neighbouring organs exerts *pressure*. More often there is simple *regurgitation* of the morsel, which may be complete; it may happen immediately or after some delay; even in the latter case there is no act of *vomiting*. Or the regurgitation may be partial, the morsel going back a little way and then descending again. Hamburger noted this in cases of small excrescences, slight callosities, obstruction from tuberculous bronchial glands, and incipient stenoses.

Noisy regurgitation has been occasionally heard, *e. g.* in stenosis of the cardia, opposite the seventh and eighth dorsal vertebræ.

The œsophagus must only be auscultated when the stomach is empty.

Luschka, of Tübingen ('Virchow's Archiv,' xlii, 4, p. 473) describes

a case of enlargement of the œsophagus, occurring in a woman, æt. 50, who had long been able to regurgitate her food without inconvenience, but who latterly had several times brought up blood; and certain of the lymphatics had become cancerous. Malignant stricture was suspected to be the cause of these. The woman died before a long time had elapsed, but from the effects of pulmonary œdema. The œsophagus was found to be enlarged, so as almost to resemble a stomach, measuring from the cricoid to the stomach 46 centimètres; the normal size being 29, or in very tall men 33 centimètres. In form the dilatation was spindle-shaped; its greatest width being near its lowest extremity, where its circumference measured 30 centimètres, its diameter 14·2. The walls were also more than double the normal thickness. The principal share in this thickening depended on the layer of contractile fibres, which, as well as the longitudinal fibres, appeared to be increased in number rather than size. The stomach was healthy, and the cardia appeared normal.

Fatal or Dangerous Results from Swallowing in Paralysis of the Gullet in Children.

The accident of choking occurs in two forms, one from impaction of substances attempted to be swallowed in the glottis, whence they are carried into the lungs, or from sticking of a hard morsel half way down so as to compress the windpipe and cause suffocation. Gaping, laughing, screaming, loud talking, &c., during eating and drinking, which cause the larynx to be elevated and the glottis open, is the most frequent cause of choking, but it is also produced by considerable dysphagia in consequence of inflammation of the upper part of the pharynx, and especially by paralysis of the pharyngeal muscles. If the soft palate is involved there is reflux of food, especially fluids, into the nose. It is not necessary to say much of those cases in which a solid mass of food sticks at the upper part of the pharynx. One case will suffice for an illustration. A lively, quick, and intelligent child, seven years old, swallowed very hastily a rather large piece of half-cooked meat. The morsel remained sticking in the throat, the child was quite unable to swallow it, or to get the piece up again, nor could any of the friends remove it from the throat or push it down. A powerful dyspneal convulsion lasted for some minutes, the face was livid, the vessels swollen, the eyes started out of the head, and the child collapsed and died. Help was sought for on every side, but no surgeon came till twenty minutes after death. The first who arrived made an opening with an ordinary bistoury in the cricoid cartilage and attempted to inflate the lungs through a tube, but all efforts were vain. The piece of meat was found sticking in the upper part of the pharnyx, and compressing the larnyx, so as to completely stop the breath. Probably in such cases the use of a bougie or an œsophageal forceps might save life, if applied early enough. The same, indeed, may be said of timely tracheotomy, but the necessary time is not always to be obtained. In the cases where foreign bodies have been drawn into the larynx and the trachea in swallowing, not much need be said. In general, they are not

very rapidly fatal, but they are always dangerous and generally demand surgical interference.

Cases of dysphagia from inflammation of the pharynx are very common. They often occur in children in consequence of inflammation of the upper part of the pharynx. Children who are old enough to express themselves say that they are not in a condition to swallow, and that everything that they take sticks in their throat. With younger children dysphagia discloses itself first by an obstinate resistance to taking either food or drink, so that there is a real danger of starvation; or, on the other hand, there are attacks of choking or violent cough, and symptoms of suffocation when it is attempted to administer food or drink by force.

A little girl, æt. 8, suddenly attacked with pharyngitis, was with difficulty persuaded to swallow a small quantity of bread and milk. The morsel stuck in the throat, and was obliged to be fished out again, as the child could not swallow it. It was only after three or four days and the application of leeches and poultices to the throat that swallowing became possible. It may be remarked that the introduction of the stomach-pump, which was once attempted, produced violent convulsions. There are also two pathological circumstances which may cause dysphagia, inflammation, and paralysis; and a third cause may be mentioned which also produces dysphagia, the presence of an abscess behind the pharynx. All three conditions are dangerous in themselves and dangerous in their effects. Paralysis of the pharyngeal muscles may starve a patient to death, and it may be questioned whether the great difficulty of persuading many insane persons to take food or drink does not arise from a sensation of paralysis in the gullet. At least we have remarked that in such persons a teaspoonful of food forcibly introduced into the mouth will remain in the throat, and either produce symptoms of suffocation or come out again from the mouth or nose. A similar occurrence often happens in typhus and in many brain affections, and if the possibility of such an occurrence in children be neglected the forcible administration of food, drink, or medicine, may produce sudden death. It is unnecessary to say anything as to the difficult diagnosis of pharyngeal abscess. It is enough to say that dysphagia may be suspected to arise from this cause. It is easy to recognise inflammatory dysphagia, for pharyngitis is generally accompanied with pain. For the inflammatory form the best treatment is the application of leeches, poultices, and milk. Retro-pharyngeal abscess must be diligently sought for and opened when found. Paralytic dysphagia is to be treated by the application of remedies especially adapted for paralysis. If the paralysis is caused by a disease of the brain, local action on the nerves of the pharynx will do no good. It is necessary, as far as possible, to attack the disease in the nervous centres. If the paralysis depends on poor blood-making or occurs after diphtheria, a journey into the country is especially recommended. The author considers that friction of the neck, injections of atrophia, strichnia, &c., may be of use, but does not define to what extent or with what precautions. It is, above all, important that people should be compelled to eat and drink, and the stomach-pump must only be used in paralytic cases. In the latter

sudden attempts at swallowing in eating and drinking must be specially avoided. The mouthfuls taken must be small, and the attempt to swallow must be quiet ('Journ. f. Kinderkr.,' xlviii, 1867).

Ulcer of the Stomach, Dyspepsia, &c.

Dr. Fleckles reports very favorably on the influences of the waters of Carlsbad in this disease. He gives it in small and frequently repeated doses for eight days, and then gives an interval, during which the patient is to take warm baths of 95° Fahr. The attacks of pain in the pit of the stomach are to be relieved with morphia. The regulation of the diet is of the very highest importance as an aid to the cure ('Schmidt's Jahrb.,' 139, p. 114).

Dr. W. Ebstein, of Breslau, reports cases in which ulcers of the stomach and duodenum were caused by trichinæ. A girl, æt. 21, died soon after her mother from very severe trichinosis. The stomach was much distended, the mucous membrane of the posterior wall of the fundus suffused with blood, and in the neighbourhood of the pylorus there were superficial hæmorrhagic erosions. On the posterior wall, near the pylorus, there were five ulcers, whose margins were sharp, with brownish scabs still somewhat adherent to their edges; the bottom of the ulcers was yellowish, the parts around pale and healthy. In the duodenum there was found a perforating ulcer which opened just beneath the liver. On the posterior wall of the duodenum there were two other similar ulcers, only not perforating. There were plenty of trichinæ in the muscles, but none in the stomach or duodenum.

Dr. Wyss examined the body of a cat strongly affected with trichinosis, and found ulcers in the duodenum.

Cohnheim, on the other hand, from his large experience at Hedersleben, has found no proof of any connection between trichinosis and affections of the stomach mucous membrane. Such, at least, is his former conclusion, yet from his own reports it appears that, of 17 cases, 3 exhibited remarkable pathological changes of a similar kind to those above described (Meissner, in 'Schmidt,' 138, p. 93). (It may be remarked in general that there is great difficulty in deciding how far trichinosis really had to do with the production of ulcers in these and similar cases. It is very well known that ulcers, at least of the stomach, are extremely common, and that they often heal spontaneously, as is proved by the frequent traces of their scars found in the bodies of persons who have died of other affections.—F. E. A.)

Dr. Balthazar Foster gives some cases ('Lancet,' April 25, 1868) of gastric ulcer successfully treated on the principle of giving the organ rest. The patient is to keep the recumbent posture, to taste neither food nor drink, and to have frequent nutrient enemata. In the second stage the diet is to be carefully regulated. Opium may be added to the enemata with advantage. Pepsine added to the enemata causes irritation.

Oppolzer, writing on enlargement of the stomach in the 'Wien. Med. Wochenschr.,' xvii, 28, 29, says this may depend on two causes—on muscular paralysis or pyloric obstruction. The first most frequently follows gastric catarrh, ending in fatty transformation of the muscular tissue of

the stomach or increase of the connective tissue, in the same way as peritonitis or gastritis may act. Paralysis also occurs in certain severe ecute disorders, as typhus, puerperal fever, sepicæmia, the acute axanthemata, &c. The pylorus may be blocked up by hypertrophy of the mucous membrane, pathologic new formation, or cicatrices. The remarks were founded on the case of a boy who had swallowed oil of vitriol, and whose pylorus was so contracted as hardly to admit of the passage of a quill.

Ullersperger ('Wien. Ztschr.,' xxiii, 1) treats of dyspepsia. The following are the forms he recognises:—(A) Forms from anomalies of innervation. (1) Neurotic stomach and gut dyspepsia; (2) Motor ditto; (3) Dyspepsia from abnormal innervation of the secretory apparatus; (4) Dyspepsia from combined anomalies of innervation. (B) From anomalies of vascularity. (1) Dyspepsia from irritation; (2) Dyscrasic dyspepsia. (C) Dyspepsia of organic chemical characters. (1) Mucous dyspepsia; (2) Gaseous or flatulent dyspepsia. (D) Intestinal dyspepsia. (1) Dyspepsia per consensum, sympathetic or symptomatic dyspepsia; (2) Dyspepsia accompanying other enteric affections.

Dr. Hyde Salter, in a lecture on hysterical vomiting ('Lancet,' July 4, 1868), describes the case of a girl, æt. 19, who has always suffered from irregular pains and vomiting. She became much worse when she began to menstruate, and has remained so. No cause except hysteria could be assigned.

The case of Dr. Kennion, of Harrogate, described by Dr. Allbutt and others ('Lancet,' July 18, 1868) is interesting. He had slight symptoms of pleuro-pneumonia, afterwards of obstruction of the bowels. Ultimately he sank, and it was found that there existed tight bands uniting the colon to the gall-bladder; that openings between the two existed, as well as into a kind of cavity between them. Some of the contents had escaped into the peritoneum. No gall-stones were found.

Pyrosis.

Dr. H. Lawson defines pyrosis as a variety of chronic gastric catarrh, in agreement with Handfield Jones. He finds that the fluid ejected from the stomach is strongly acid. Not only in the so-called characteristic pyrosis, but in gastric catarrh, ulcer, carcinoma, and irritable conditions of the stomach associated with periodic disturbance, a thick, glairy, opalescent, semi-mucous, sour liquid is with greater or less frequency ejected. This condition has been found very intractable, if not incurable. After trying a variety of ordinary remedies with no success, and the alkaline sulphites or hyposulphites with partial success, Lawson was led to try sulphurous acid. He gives it in doses of half a drachm to one drachm three times a day, shortly before meals, and he finds it produced much superior effects to those of any other drug; indeed, it proves curative in many cases. As regards the explanation of its action, Dr. Lawson inclines to the view that its good effects are due to the production of ozone, and the destruction of vegetable germs of which there are enormous quantities in every specimen of water-brash. The idea agrees with the facts observed by Pasteur as to the

powerful influence of such organisms in promoting fermentation. The clusters of leptothrix, &c., must produce irritation from the manner in which they are buried and rooted in the very substance of the epithelium-particles. It would seem that it is by the destruction of these parasites that sulphurous acid proves beneficial in pyrosis ('Practitioner,' Sept. 10, 1868).

Dr. Cuthbertson narrates a case of ulceration of the duodenum following a burn ('Med. Times and Gaz.,' Sept. 28, 1867). The patient, a boy, æt. 10, was extensively burned with a hot alkaline solution on July 21, 1867. His wounds were dressed with carron oil, (linseed oil and limewater), and he did well till August, when he began to complain of pain and tenderness in the epigastrium. He also passed blood both by mouth and bowels. This began in the morning. Acetate of lead was ordered, but the bleeding continued during the day, and he died in the evening. On opening the abdomen a perforating ulcer was found on the anterior surface of the duodenum an inch from the pylorus. This was an inch and a half long; another on the posterior surface was about the size of a threepenny piece.

Mr. Bradley narrates a case of fatal hæmatemesis from ulceration of œsophagus and perforation of the aorta ('Med. Times and Gaz.,' Oct. 17, 1868). The patient was a professional passer of base coin, who, to save himself from detection, had attempted to swallow a bad half-crown. In prison he was seen by Mr. Bradley, but he seemed healthy and ate his food without inconvenience up to the day of his death. He occasionally complained of vague pains in his chest and other slight symptoms of dyspepsia. It was supposed that the coin might have lodged in the stomach, and a little opening medicine was given. One day he vomited a good deal of blood and was removed to the infirmary. Two hours after, while sitting up in bed to take some food, the hæmorrhage returned, and he sank back and died. The body was well nourished. The stomach and intestines contained a good deal of blood, except in the descending colon. In the œsophagus was found a somewhat circular ulceration with dark edges corresponding with those of the coin; in its centre was a perforation the size of a goose-quill, through which the probe could be passed into the centre. The coin had been held in a shallow pouch in such a way as not to interfere with the passage of food. The coin was not corroded.

Dr. Andrew Clark gives ('Brit. Med. Journ.,' June 8, 1867) some interesting details of certain cases of duodenal perforation. In one instance the patient, a male, æt. 35, had complained of slight indigestion, had breakfasted as usual, and had taken some medicine he had been given for his indigestion. He was suddenly seized with indescribable pain on the right side between the liver and the groin, and was brought into hospital. There was no tenderness on pressure, his legs were moved about in any way, there was neither vomiting nor purging, nor were his testicles retracted, but the pain extended both upwards and downwards on the right side; his pulse was 76, and his urine was healthy. The diagnosis was very difficult. He had some opium, and turpentine was applied externally, which relieved him for a time, but the pain suddenly returned and spread over the belly, which speedily became swollen, and in six hours

the patient died. The peritoneal cavity was filled with flaky serum, the intestines were matted together. Just below the middle of the liver the duodenum and the pancreas were joined together by old and new lymph; at one side of this was a rugged opening into the duodenum half an inch in greatest diameter. This was at one side of the base of an ulcer near the pylorus, about an inch in diameter, and with shelving edges; the base was formed of thickened peritoneum. A cicatrix of what seemed an old ulcer was close at hand. He had been ill sixteen hours. The food had, probably by distension, caused a slight rent, which had been to a certain extent obviated by treatment, but in the evening he drank heartily of water, which caused the fatal tear. Other interesting cases are given.

The Chronic Diarrhœa of Children.

Dr. Müller, of Riga, lays down the following rules for the application of remedies in the diarrhœa of children.

(1) As to evacuant remedies. The physicians of last century frequently used emetics of ipecacuanha, especially at the beginning of the disease, but latterly this practice seems altogether abandoned. For the most part the same may be said of laxatives. Castor oil in moderate doses in later childhood, at the commencement of its intestinal catarrh without fever, or where errors of diet have brought about mischief in the course of such a complaint, is often of considerable service. It will do all that any purgative could do under such circumstances.

(2) Of absorbent remedies magnesia and the carbonates of alkalies are most used. For little children small doses of bicarbonate of soda to be employed; older children are given limewater by Müller in preference to all other absorbents. It should be used directly there are signs of acidity or upon considerable flatulence. But these must always be considered as mere purgative remedies.

(3) Mineral astringents are much in fashion, especially of late years, in chronic intestinal catarrhs. Bismuth the author has used a few times, and the results so far are very good. He would certainly use it in every case in which there were not some special indications for another remedy. Acetate of lead is but rarely applied, although it is probably of the greatest use under such circumstances. The neglect has, perhaps, arisen from its being given in too small doses. Nitrate of silver has a great many supporters, and is distinctly one of the most effective remedies in chronic diarrhœa of children. There is a good deal of doubt about the dose. Such small doses as the sixteenth of a grain are never used by Müller. He employs from the eighth to a sixth of a grain at a dose, which he gives every two hours for one day, and after that reduces the frequency. The nitrate must be dissolved only in distilled water. If there is extreme diarrhœa, tincture of opium must be put into the medicine in small quantities. The only indication for the use of opium is to prevent some other remedy, which might be of use, from being too rapidly discharged from the bowels.

Chronic habitual diarrhœa is a special indication for nitrate of silver. The following three circumstances are also special indications:—

(1) Croupal deposits in the mouth and throat, which not unfrequently complicate chronic catarrh of the intestines.

(2) A peculiar redness and smoothness of the tongue.

(3) Unquenchable thirst. The nitrate of silver has been recommended to be given by the rectum as well as at the same time by the mouth. The author has no experience of it in this way. He recommends injections of—

(4) Vegetable astringents and tonics. The author has experimented with two such remedies, namely, the extract of the campechy wood and calumba. The former has no right to its reputation.

(5) Iron. The chloride of iron, according to Romer, the pernitrate of iron according to the French authors, are indicated in the chronic diarrhœa where softening of the mucous membrane may be feared. The stools then often contain decomposed blood, and the symptoms of amnesia are considerable. Binz employs syrup of iodide of iron in doses of two or three drops several times a day.

(6) Stimulants. The remedies of this class which in high doses produce narcotism are very much in fashion. The author himself has followed Romulus's advice in giving tokay to children in circumstances of much exhaustion with good results.

It remains to mention the diet in chronic diarrhœa of children. The importance of this subject is usually recognised, but it is very difficult to make a choice of the best food, on account of the difference between individual constitutions. Two principal methods are recommended—milk diet and meat diet. As regards the wholesale recommendation of milk, two things are to be remarked—whilst very many uphold it, a great many contradict it. Vogel especially observes that young children will not tolerate cow's milk, either alone or mixed with tea, or made into a porridge with bread or flour.

Müller's experience tells in favour of this opinion. He finds that milk constantly increases the diarrhœa, and he has had similar experience with his colleagues at his residence. Possibly climatic or local peculiarities may be influential and may help to explain the differences of opinion. Woman's milk appears to be somewhat differently placed in this regard. Occasionally in obstinate diarrhœa good has been done by putting children long weaned to the breast again, a somewhat difficult proceeding.

Weisse, of St. Petersburg, recommended for weaned children raw beef flesh. Müller has used it with the most striking result also in chronic diarrhœa of later childhood, especially where there is much amnesia. The worst of it is tapeworms may ultimately result from this. The treatment should not be abused, and should only be applied in obstinate diarrhœa of weaned children. It appears that the administration of raw meat has not yet become very general. Müller therefore thinks it not unnecessary to describe the mode of its use in detail. The meat must be best fillet, as much as possible free from fat. It must be chopped fine and grated into a pulp, and this must be strewed with a little salt. Two table-spoonfuls are to be taken, at about four meals in the twenty-four hours. If the food pleases the child, that is an infallible sign it is doing good, the quantity daily may be somewhat in-

creased. Later, as much may be taken as the child pleases. It generally happens that at the beginning they refuse this kind of flesh. It should then be mixed in soup, or in the child's most favorite drink. A little trouble and pains must be taken, and after a time children, who at first refused the food, will take it with great appetite ('Journ. f. Kinderkr.,' May and June, 1868).

Typhlitis Stercoralis.

This affection, which is also sometimes called simply typhlitis, is a disease only lately heard of under these names. It used to be confounded with other affections, but is now recognised as an independent and peculiar disease. Dr. Bierbaum relates the following case:—A child, æt. 12, strong and healthy, had taken some vegetable soup, when it was attacked with pain in the belly and a sense of severe pressure in the hypogastrium. The following day there was also vomiting. On the third day, the pain rather having increased than diminished, medical advice was sought. The child was now constantly lying on its back and had its right leg drawn up. There was continuous pain, occasionally becoming more severe, and causing the child to cry out. In standing or walking the child bent the body over to the right side and had great pain in putting out the right foot. The pain was in the right ischial fossa and extended further downwards to the right groin. In the right hip-joint there was a soft, circumscribed, sausage-like swelling, which was painful on handling. The belly was moderately distended, not painful on pressure; there was constipation, furred tongue, bad taste in mouth, no appetite, excited pulse, but no elevation of temperature, nor headache, whilst sleep was prevented by the pain. The painful swelling was ordered to be rubbed with an ointment of althea and oil, and covered with lint. Magnesia was given internally. The next day three fluid stools occurred, pain was diminished, and the tumour was hardly painful on touch and seemed also softer. There was a certain amount of flatus, the tongue was hardly improved, the temperature was raised, the head and face was strongly perspiring, the rest of the body only slightly so. The next day half an ounce of castor oil taken in emulsion produced three stools which contained a round worm. The pain and the swelling in the right ischial fossa was still further lessened, but there was still some tenderness here. On the next day to this the child had resumed the natural attitude of lying on one side and then on the other, the right foot could now be stretched out straight, and there was no pain in walking, the body was also held upright in standing, the appetite was improved, although the tongue was still coated, the temperature was normal, hands cold, pulse slightly quickened and contracted, the bowels confined, urine clear and free and somewhat red. On the following day the child was convalescent, after the bowels had been moved with difficulty by half-an-ounce dose of castor oil. Its health has since been perfect.

Typhlitis stercoralis consists in severe inflammation of the mucous membrane of the cæcum, and of the ascending colon. It is caused by large accumulations of fæces, or other foreign matters, in

the ileo-cæcal region. Various organic diseases, producing more or less the obstruction of the bowels, present a similar group of symptoms, but are, nevertheless, not to be confounded with this disease. Typhlitis stercoralis occurs suddenly in good health in some cases; in others it is preceded by slight colicky pains and sense of pressure in the hypogastrium, constipation, or diarrhœa. These symptoms are often so trifling as not to be noticed, but the disease soon sets in with all its terrors. There is violent colicky pains in the bowels, of a somewhat intermittent character, and uncontrollable vomiting occurs; the constipation is most obstinate, the belly is invariably swelled, and in the right part of the belly, below, there is a circumscribed swelling. The pathognomonic proof of symptoms is easily understood, if we imagine a reversed peristaltic action (!) set up by the obstruction of the bowels.

The following is a summary of the disease:—1. The physiological character of typhlitis stercoralis is recognised by vomiting, obstinate constipation, colicky pains, distension of the belly, and a swelling in the right hypogastrium. 2. The disease is anatomically a severe inflammation of the mucous membrane of the cæcum and ascending colon. 3. In order to make a sure diagnosis, all the peculiarities of the disease must be closely examined, in order to exclude other varieties of intestinal obstruction. 4. The disease does not always remain simple; occasionally it is accompanied with peritonitis or inflammation of the connective tissue which unites the ascending colon with the fascia lata. 5. Typhlitis stercoralis occurs but rarely in all ages of childhood, and in infancy is either never or very seldom seen. 6. The etiological relations to the disease yet require further explanation. 7. The disease involves a serious danger in itself, and still greater danger through the possibility of perforation in the progress of the inflammation. 8. An early and appropriate treatment may be expected to produce good results. Purgatives, blisters, local bleeding, and warm fomentations are the most reliable remedies ('Journ. f. Kinderkr.,' xlviii, 1867).

Dysentery.

Dr. Morse, of San Francisco, says that in chronic dysentery uncomplicated by organic disease of the heart, phthisis, or irremediable obstruction in the liver or spleen, he has met with marked success by throwing into the rectum and colon from two to five pints of Labarraque's solution of chlorinated soda, largely diluted. The diet is first of all to be regulated, and the patient should keep the recumbent posture for some time. At daybreak, every third or fourth day, he gives a mild aperient, in order to clear out the bowels. After this has acted two to four pints of the liquid are to be injected; as much, indeed, as the bowel can be made to retain. Each succeeding enema should be made stronger until the patient says it smarts, when its strength is sufficient. Should there be much tenesmus after, Dr. Morse gives an opium enema or suppository. He repeats the chlorine injections twice a day if necessary, but not as a rule. Occasionally, it is necessary to leave them off altogether for a time. The bowels should also be kept quiet, so that the ulcers may have time to heal ('California Med. Gaz.,' Sept. 1868).

Dr. G. Kerner, of Frankfort, has examined the action of chinovic acid, a resinous constituent of bark, in the treatment of dysentery and of chronic so-called nervous diarrhœa. The acid exists in cinchona barks, in the form of chinovin, in which it is combined with a peculiar sugar. Chinovin may be obtained in a state of purity by boiling bark with milk of lime, and precipitating the decoction with muriatic acid. The precipitate is rapidly dissolved in milk of lime, decoloured with animal charcoal, and reprecipitated with muriatic acid. Chinovid of lime, which is the best medicinal form of administering chinovic acid, is prepared by dissolving well-purified chinovin in milk of lime, filtering the solution, and evaporating it to dryness. It is given in doses of from two to eight grains every hour in acute diarrhœa and dysentery. It does not cause symptoms of cerebral congestion, like quinine, when given in large doses. It is a bitter acid tonic, which exceeds in value the majority of all discovered bitters ('Deutsche Klin.,' 9 and 10, 1868.)

In 'l'Union Méd.,' iii, 1867, p. 100, is recorded, by M. Boisseau, the case of a soldier who died of intestinal obstruction induced by the collection of the refuse of strawberries (the fruit or achenes), in great quantity, in the ileum, near the ileo-cæcal valve. The case is certainly peculiar.

Dr. T. Heron Watson ('Edin. Med. Journ.,' May, 1868) gives a paper on intestinal concretions. He points out that these are far less numerous nowadays than formerly, owing to the oats being better prepared for food. Two things are, he says, necessary for their formation—a nucleus and a material whereof to form the concretion. For a nucleus gall-stones may often suffice, as he shows by a case which came under his notice. The case he gives in illustration was that of a man who had long been dyspeptic, who felt a tumour forming in the gut, but which gradually became displaced. He next observed difficulty in passing his motions, and that a lump came down and obstructed the gut when he went to stool. Gentle aperients alone relieved him. On examination a hard mass could be felt in the rectum; this was ejected by the fingers. Another was removed in like manner, and the man was cured. The larger mass weighed 627 grs., the second 538 grs. The smaller was dense and stone-like, consisting of phosphate and carbonate of lime and ammoniaco magnesian phosphate; the nucleus consisted of phosphate of lime. The larger and lower consisted of two parts—a crust of earthy material, and a nucleus consisting mainly of the covering of the oat, or rather of the minute hairs found below this.

Dr. Paterson records a case ('Edin. Med. Journ.,' June, 1868) where fifteen intestinal concretions were passed with permanent relief. The illness of the boy began when eight years old with an attack of scarlatina followed by dropsy, after which for eight years he was constantly attacked with colic. Five years after these symptoms had begun a doughy tumour could be felt at the head of the colon; and not long after this, after an excessively severe attack of colic, a body said to be a plum-stone, was passed. After this he was for a time better, but the attacks returned. The tumour meanwhile had increased, was harder, and more tender. Latterly the colicky pains were almost constant. On Christmas-eve, 1867, he obtained relief by passing four calculi, soft and velvety, with indented surfaces, as if from mutual pressure; more could be felt in

the cæcum; but no more were passed till April, 1868, when eleven more came away, after which perfect relief was obtained. The surfaces of the calculi were velvety, not smooth; they were extremely light, sp. gr. ·709, so that they floated on the water; and they were composed of the hairs of the oat (*Avena sativa*).

Dr. Murchison uses belladonna with great good effect in severe forms of colic and constipation (*vide* 'Lancet,' i, 1867, p. 81).

A curious case of this kind is given in the 'Lancet,' March 14, 1868, by Mr. Jeffreys. The man was seen on Saturday; his bowels had not been opened since Monday, and there was much pain in the left side of his abdomen, where a tumour could be felt. A purgative was given, which acted freely, but without relieving the other symptoms. Ultimately the patient confessed that a week before suffering from diarrhœa he had been induced to plug his rectum. This wooden plug had disappeared, and had given rise to the symptoms. Mr. Jeffreys removed it with some trouble, and found the plug to be five inches long, and to have a tenpenny nail, of which two inches projected, driven into it, that it might be the more easily removed.

Tumours, &c.

M. Bordillat records ('l'Union Méd.,' ii, 1867) an interesting case of lymphatic tumour of the small intestine and abdominal wall. The patient was a child twelve years old, which came into St. Eugenie with a greatly enlarged abdomen. It had suffered much from peritonitis and irregular diarrhœa. It died not long after admission. The glands were hypertrophied; but the most noticeable phenomenon was a floating mass near the head of the cæcum. In the intestinal wall was another tumour like the former. Cornil and Ranvier declared the structures to be lymphoid.

Dr. Habershon gives, in the 'Lancet,' May 4, 1867, some clinical notes on ascites. He enumerates—1st. Atrophic ascites present in wasting diseases or in old age, when it is mostly of the nature of an exosmosis. 2nd. Ascites from obstruction or mechanical impediment, as when cancer spreads to the cava itself, or even to the vena portæ. More frequently this variety arises from chronic disease of the heart, lung, or liver; in the two former there will be anasarca as well. Inflammation of the peritoneum is easily set up in these forms of disease. Obstruction to the thoracic duct may give rise to a form of ascites. 3rd. Ascites with renal disease, or in dropsy following scarlatina; here also inflammation is readily set up, perhaps owing to the presence of urinary products in the fluid effused. 4th. Glandular ascites, a passive form depending on changes in the blood, induced by disease of the blood-glands or of the spleen. 5. Inflammatory ascites, which may often arise without pain, especially in weak and strumous subjects, and may be variously induced, often following acute exanthematic disease. 6. Strumous ascites. This chiefly depends on deposit of tubercular matter on the serous surface or mucous surface, inducing inflammation, with matting of the intestines and effusion of fluid at the same time. 7. Cancerous ascites. In this form there are many slight deposits of cancer below the peritoneum which cause the effusion.

Intestinal Obstruction.

Dr. Hilton Fagge communicates to the 'Guy's Hospital Reports' for 1868 a very valuable paper on intestinal obstruction as it has occurred at Guy's Hospital during the last fifteen years. The number of autopsies which have been made is rather more than 4000, out of which 54 cases of intestinal obstruction are reported. Apart from the various forms of hernia coming under the surgeon, the various forms of intestinal obstruction naturally fall under six heads. Taking those first in which the mucous surface of the bowel is affected, and passing gradually to those in which the constricting force acts upon its external surface, we have—

1. *Those in which the gut is plugged by its contents.*—Under this head are included gall-stones, intestinal concretions, masses of ingesta, &c.

2 *Intussusceptions or invaginations.*—In so far as these produce obstruction of the intestine, they may be regarded as analogous to the agents which are concerned in the first class of cases; the difference is that the bowel is now plugged, not merely by a foreign body, but by another portion of the bowel, which is itself sooner or later strangulated by the pressure to which it is subjected.

3. *Strictures.*—In these the disease is situated in the substance of one or more of the coats, and ultimately narrows the calibre of the intestine.

4. *Contractions.*—Under this head are placed a large number of cases often confounded with strictures, but differing from them in some important respects. In these instances the disease begins, not within the intestinal coats, but on their exterior—sometimes on the serous surface of the intestine, sometimes in the mesenteric glands. The obstruction, when it occurs, arises, not merely from a narrowing of the calibre of the bowel, but partly from the adhesion of one coil to another or to some other structures, or from puckering and contraction of the mesentery.

5. *Volvuli, including folds and twists of the intestine.*—In these there is no new formation either within or without the intestinal coats. The obstruction, or even the strangulation, is due simply to the pressure of adjacent portions of the bowel or its mesentery, or both.

6. *Internal strangulations*, strictly so-called, in which the constricting agent has no structural connection with the circumference of the intestine strangulated, but is independent of it, and invested with a distinct peritoneal covering.

Dr. Fagge says that in certain instances the means for perfect diagnosis are wanting, so that we cannot conclude where the disease is situated, or predict what will be the post-mortem appearances. It is, therefore, necessary, in endeavouring to distinguish clinically the different forms of obstruction, to supplement the broad facts of the case by careful questioning, by continued observation, and by special investigation. To this end a *method* is necessary, and practically the first point to be determined is whether the disease is situated in the large or small intestine. The following distinctions have been laid down:

In obstruction of the small intestine.	*In obstruction of the large intestine.*
1. The pain and other symptoms are more acute and the course more rapid.	1. The pain and other symptoms are less acute and their course more gradual.
2. Vomiting is early and urgent.	2. Vomiting is long delayed, or of but little severity.
3. The urine is scanty.	3. The urine is abundant.
4. Distension is early, but not excessive, and affects the small intestine alone.	4. Distension occurs only after an interval, but reaches an extreme degree, and affects especially the large intestine, so that the transverse colon may be seen crossing the upper part of the abdomen, and there is fulness in one or both loins.

In a certain number, says Dr. Fagge, these distinctions are maintained, but this result is accidental, and the above criteria are in a great degree invalid when applied to individual cases. In proof of this he cites two cases.

1. A man suffers from attacks of abdominal pain, in which the coils of intestine can be seen and heard working in the abdomen; he has suffered from these attacks for four months before admission, and continues to do so during the month he resides in hospital; he has neither nausea nor sickness; his bowels are costive, and he is constantly obliged to take aperients; the abdomen is prominent and rounded, but the distension is chiefly confined to the lower part of the belly; there is no anxiety of countenance.

In this case the symptoms were those of obstruction of the large intestine, but the post-mortem examination ultimately showed that the ileum was the seat of the disease.

2. A young woman, previously quite well, is taken ill on October 4. From that time she retches constantly, and brings up some tea and some brandy which she has swallowed. She is in continual pain. She is admitted on the 7th, and dies on the following day. On her admission she is much collapsed, and has great anxiety of face. She passes only 2·2 oz. of urine after this time. Her medical attendant had previously introduced a catheter, but drew off merely a little bloody liquid. The abdomen is enormously distended, tense, and hard; it presents a transverse line about midway between the epigastrium and umbilicus.

In this case, again, the symptoms are almost all such as would indicate obstruction of the ileum, but on post-mortem examination the point of stricture is found to be the sigmoid flexure of the colon. In each of these cases there was one feature which pointed in a different direction from the other symptoms, and, as it happened, in the right direction. This was the form of belly. In the first case distension was limited to the lower part of the belly; this might lead one to think the obstruction was above the large intestine. Still the inference would not, as other cases given by Dr. Fagge show, be justified by experience. So, again, the line across the abdomen in the second case would go to

show that the colon was affected low down; but other cases contradict the validity of the sign.

Dr. Fagge is inclined to believe that the seat is not so much the key to the symptoms as is the nature of the obstruction, *i. e.* of the pathologic lesion causing it, being of one kind in a case of stricture, whether of ileum or rectum, and of another kind in a case of strangulation of the bowel, whether of the small intestine and its mesentery by a band or of the sigmoid flexure by a twist of that bowel on its own axis. But strictures of the large intestine are common, those of the small intestine rare; whilst, conversely, it is the ileum, and not the colon, which is most apt to become strangulated. So that thus the distinctions which depend on the *nature of the lesion* have been associated rather with its *seat*.

Dr. Fagge then proceeds to inquire into the value of the symptom *scanty urine* as indicating obstruction of the small intestine. Dr. Barlow was the first to point out the importance of this indication; he attributed it to the seat of the disease; some later writers rather to the quantity of fluid vomited in obstruction of the upper portion of the small intestine. Dr. Fagge inclines to the view of Mr. Sedgwick, that the site causes the suppression, but not on account of its interfering with the absorption of fluid so much as with the innervation of the parts concerned. Dr. Fagge next proceeds to give, in their respective order, all the different causes of obstruction he has above described, with the cases illustrative of each. He is in favour of exploratory operations in carefully selected cases of internal strangulation; of inflation for intussusception. With regard to volvulus, he gives no decided opinion.

Other papers on the diseases of the alimentary organs:—

Galvagni, ascites caused by sweating ('Rev. Clin.,' vi, 3 Marzo, 1867). Prof. E. Wagner, researches on the pathological anatomy of the œsophagus ('Arch. d. Heilk.,' viii, 5). Lasaigne, on peritonitis ('Arch. Gén.,' 4 sér., ix, p. 448). Bluchez, on peritonitis ('Gaz. des Hôp.,' 109, 1867). Duparcque, on peritonitis (ibid., 110, 1867). Hoffmann, case of perforation of the gut ('Virchow's Archiv,' xlii, p. 227, 1868). Fuller, on excess of urea as a guide to the diagnosis of certain forms of dyspepsia ('Proc. Med. Chir. Soc.,' Nov. 26, 1867). Bristowe, ascites. Dr. Bristowe advised, when other means had failed, the use of tonics, which in his hands had proved successful ('Clin. Soc.,' Nov. 13, 1868). De Savignac, paralysis which accompanies and follows dysentery ('l'Union Méd.,' iii, 1867, p. 200). Kerr, new remedy for dysentery. This consists principally of digitalis, but the exact composition is not given in the paper referred to, but in a former one; he reports much success ('Edin. Med. Journ.,' Sept., 1867). Hamilton, obstruction of the bowels (ibid., Oct. 1867). Farquharson, perineal abscess (ibid., June, 1868). Althaus, obstinate constipation treated by faradisation of the bowel ('Lancet,' Nov. 16, 1867). Day, gastrodynia (ibid., Dec. 21 et seq., 1867). Habershon, catarrh of the colon (ibid., Jan. 4, 1868). Habershon, pleuritic effusion on the left side as a cause of flatulence and dyspepsia (ibid., Feb. 8, 1868). Moses, stercoraceous vomiting lasting seventeen days; recovery ('ibid., March 29, 1868). W. D. Jones, fatal hæmatemesis, In this case there was great contraction of the liver, and the vessels of the stomach were remarkably dilated (ibid., March 29, 1868). Maunder, diagnosis of obscure disease of the rectum. The author puts the patient under chloroform, oils his hand, and introduces it obstetric fashion as far as the knuckles, and thus obtains more room (ibid., May 9, 1868). Everet, gastrodynia (ibid., May 9, 1868). Hewan, treatment of dysentery by ipecacuan and by a new remedy. This is Kerr's remedy, above alluded to. It contains opium, stramonium, dulcamara, and digitalis, sium lineare,

cicuta maculata, and coniellinum canadense (ibid., June 27, 1868). Copeman, obstructions of the bowels, withcancer ('Brit. Med. Journ.,' Sept. 5, 1868). Beveridge, pathology of ileus. The author aims at showing the mechanical and not necessarily inflammatory nature of the complaint—(ibid., Dec. 5, 1868). Boyes, spasmodic closure of œsophagus (ibid., Dec. 26, 1868). Wynne Foot, pica ('Dublin Quarterly,' May, 1867).

F. DISEASES OF THE SECRETORY SYSTEM.

Kidney Diseases.

Dr. R. T. Edes, of America, writes on the prognostic significance of casts and albumen in the urine. There are two classes of cases in which the occurrence of casts, though always requiring attention, is much less formidable than in other forms of disease. 1. In acute renal dropsy they are not a very dangerous symptom. The process in the kidneys is analogous to the desquamation of the skin, although, from the form of the tubes, it is a more difficult and complicated process. 2. During pregnancy, and for some time after delivery, casts and albumen may occur without the slightest bad symptoms.

As against the view that granular degeneration of the kidneys, when present in a patient attacked with erysipelas, renders the case almost hopeless of recovery, the author adduces the history of a severe erysipelas going on to gangrene, and causing premature labour, in which both albumen and casts were present; nevertheless the woman recovered without a single bad symptom.

Dr. Bradbury sends to the 'Brit. Med. Journ.,' April 18, 1868, some account of a case of Bright's disease following on ague. It has been said that in the dropsies following ague there is never evidence of kidney disease. The patient, a labourer, æt. 36, was admitted into Addenbrooke's Hospital, Cambridge, under Dr. Paget. He had suffered badly from ague some time before, and had already been treated for dropsy. When admitted he was pallid and puffy, and his legs, scrotum, and abdomen, were dropsical. His urine had sp. gr. 1017; it became almost solid with heat and acid, and contained hyaline, granular, and fatty casts. There was no cardiac or pulmonary disease. His legs had to be punctured. He did not do much good with elaterium, but improved under digitalis, cream of tartar, and juniper. He finally recovered.

Dr. Basham narrates ('Lancet,' Aug. 24, 1867) a highly interesting case of acute dropsy without albuminuria. The patient, a man, æt. 26, had got wet and cold; a morning or two after, his face was puffy. When admitted he had all the appearances usually associated with acute albuminuria. The face was puffy, the eyelids œdematous, as were the backs of the hands and the arms to the elbows; the chest was slightly anasarcous, the lower extremities more so. His respiration was humid and moist; râles were heard all over the chest. Nevertheless, on examining the urine, which was scanty and high coloured, sp. gr. 1022, not a trace of albumen could be found, either by nitric acid alone, by heat and nitric acid, or by absolute alcohol; nor could a trace be detected during his stay in hospital. This shows that general anasarca may occur without any further disturbance than is implied by a scanty and high-coloured urine containing no albumen.

Dr. Bateman, of Norwich, gives an account (ibid., Feb. 9, 1867) of the case of a dyspeptic, who, whenever he indulged in anything inducing an attack of his malady, showed sarcinæ in his urine.

Dr. Charles Berrell gives ('Med. Times and Gaz.,' March 14, 1868) a note of the composition of the urine in a case of leucocythemia, under the care of Dr. Beale, in King's College Hospital. The total quantity of urine passed a few days before death was 26·5 fl. oz. in twenty-four hours. Its specific gravity was 1033·8. It contained—

		Normal urine at same period of life (Parkes).
Urea	504·60 grs.	361·5 grs.
Uric acid	18·28 „	6·0 „
Chlorine	9·26 „	76·0 „
Phosphoric acid	41·05 „	34·5 „
Sulphuric acid	41·80 „	22·0 „

All the elements are increased; but the most notable exception to the normal condition is the uric acid, which is in the proportion of 1 to 28 of urea, the ordinary ratio being 1 to 60. In another case spoken of by Parkes the ratio was as high as 1 to 13.

Vogel and Schmidt ('Cent. Blatt. f. Med. Wiss.,' May 30, 1868) give a plan for estimating volumetrically the uric acid contained in urine. A solution of iodine in iodide of potassium, at an ordinary summer temperature (15°—20° C.), is to be allowed to act on a dilute solution of uric acid, produced by concentrating the urine; it will thereby become decolorized, 1 atom of uric acid = 168 being equivalent to or exhausting 2 of iodine = 254. The action begins immediately, and is ended in twenty-four hours.

One atom of uric acid = $C_5H_4N_4O_3$ = 1·48 grms., dissolved in 2 of caustic soda = $2\left(\begin{matrix}Na\\H\end{matrix}\right\}O\Big)$ = 0·8 grms., gives, when diluted to 2 litres, a neutral salt of soda in solution, corresponding with the average concentration of human urine.

Ten c.c. of this solution, containing 0·0084 grms. of uric acid, on neutralization of the soda contained therein by 10 c.c. 1-100 normal hydrochloric acid, = ·00365 ClH, and this acid, treated with excess of the iodine solution, decolorises, in 24 hours, ·0127 grm. of iodine = 10 c.c. 1-100 normal solution of iodine.

By treating with hyposulphite of soda when the action has ceased, the quantity of free iodine left behind may be easily and exactly estimated. In the first half hour about the half, and in the next two hours three fourths, of the quantity of iodine indicated is used up; in 12 hours the reaction is nearly ended, and after 24 hours, in ordinary summer temperature, no further effect is produced.

The authors maintain that this process is not much liable to error, either by acids in the urine, by urea, hippuric acid, kreatin, sugar, or albumen, or even by the urinary pigments.

One grm. of uric acid accordingly consumes 1·512 grm. of iodine.

One grm. iodine consumed implies ·6614 grm. of uric acid.

Since urine seldom contains more than 1 per 1000 of uric acid,

there would be in 10 c.c. of urine 10 milligrms. of uric acid; 4 c.c. of the 1-10 standard solution of iodine (= ·0508 grm. of iodine) in a well-stoppered glass vessel, capable of containing 20 to 30 c.c., will accordingly suffice for a preliminary excess of iodine. If the urine is not perceptibly acid, it must previously be rendered so by acetic acid. The after treatment with 1-10 standard solution of hyposulphite of soda is had recourse to, or for the purpose of distinguishing the colours of this mixture of urine and iodine it is tinged blue by a drop of starch-paste; the hyposulphite of soda is to be added, by means of a ·01 c.c. pipette, to the mixture, after standing 24 hours, until the coloration begins to disappear. A complete exposition of this last reaction is given by Mohr, in his work on 'Chemical Analysis.'

The authors do not know whether the uric acid in this process is converted into alloxan or into alloxantin.

In a subsequent communication to the same journal (13 June, 1868) these authors acknowledge the priority of Max Huppert, who, it seems, had already ('Archiv f. Heilk.,' v, 1864) investigated the whole subject. Both sets of investigators are agreed that neither urea, hippuric acid, oxalic acid, kreatin, sugar, albumen, or mineral salt, have any influence on the reaction, but both would seem to be in doubt about the influence of the colouring material found in the urine; nevertheless, the authors think the process a decidedly useful one for chemical purposes.

Koschlakoff and Bogomoloff ('Centblatt. f. Med. Wissen.,' 1 Aug. 1868) point out that Pettenkofer's test for the bile acids is exactly similar to the reaction produced by egg albumen along with sugar and sulphuric acid. Like Jaffe, they propose the spectroscope for their determination, and point out that there is a dichroism with the bile reaction—a green with reflected light and a cherry-red with transmitted light.

In a valuable lecture by Oppolzer, translated for the 'New York Medical Journal' (Oct. 1868), the whole subject of diabetes is discussed. He says that, in the majority of cases, the kidneys are enlarged and swollen, their weight is increased, and they are hyperæmic or in a state of inflammation. The pyramids or cortical substance are generally hypertrophied. Still, there are many exceptions to this rule, and in a considerable number of cases the kidneys suffer no pathologic change. So it is with the liver; sometimes it is swollen and hyperæmic, sometimes amyloid. In most of the organs after death sugar is found, except, perhaps, in the brain. In the urine itself the substance called kreatinin is found. This is a nitrogenous substance, which was first demonstrated by Liebig, and afterwards by Neubauer, to be a kind of albuminous material, which also exists in healthy urine. At first it was thought that a considerable amount of it was to be found in urine, as much, indeed, as 8½ grains in the urine passed in 24 hours. It was accordingly supposed that there was some relation between the enormous secretion of kreatinin and the secretion of sugar, and especially of the diabetic process. Later examinations made at Oppolzer's clinic showed that the amount of kreatinin secreted in diabetes was exaggerated, and that in these cases the amount was not sensibly

changed. Of the symptoms of diabetes, the first and most important is the large amount of grape sugar which appears in the urine and other secretions. The quantity of sugar secreted in a day varies, but sometimes amounts to as much as a pound or more. The manner in which the patient lives has much influence on this secretion, since an increase in the quantity of fluid which is taken and the indulgence in starchy food augments its amount.

There are two forms of diabetes to be distinguished, and the distinction of the one from the other is of great importance in practice. Experience shows us that the anomalies of nutrition, which are manifestly the source of the disease, may be very different. In the first or lighter form of diabetes the secretion of sugar is present only so long as amylaceous food is supplied to the body. If only carnivorous or non-amylaceous food be eaten, the secretion of sugar, as well as most of the other symptoms of glycosuria, ceases. In the second and more serious form of the disease the glycosuria continues, although the food is of a non-amylaceous character. In many cases the diabetes is of the first form, and if the use of starchy food be dispensed with, not only does the secretion of sugar cease, but the quantity of urine passed is also diminished, the tormenting thirst and insatiable appetite abate, and the emaciation becomes less. In the second and more serious form this is not so; the symptoms either continue the same or there is only slight alteration. As a matter of course, there are various intermediate grades, and sometimes the light form is only the incipient form of the other and more dangerous one.

Besides the sugar which is found in diabetic urine, there is also an increase of the urea, uric acid, and salts, all of which contribute to its increased specific gravity, which may amount to 1042 or more. If the urine stands for any length of time spores of torulæ are found in it. The urine is clear, of a pale yellow colour, and is often evacuated in large quantities (5 to 9 quarts daily). The patients do not urinate so much because they drink a great deal, they rather drink because they have evacuated so much fluid from the body. The cause of the enormous secretion of urine must, for the present, be sought in the diuretic influence of the sugar. Inasmuch as so much water passes through the kidneys in diabetes, the secretions of the other secreting organs are necessarily limited, hence the skin of such patients is generally dry and harsh.

The tests for sugar in the urine are thus given by Oppolzer:

(*a*) *Moore's Test.*—A small quantity of the solution of potass is added to the urine to be tested, and then the urine is to be boiled. The upper part of the fluid becomes brown if sugar is present, or an excess of caustic potass is added to the urine, and then the whole is to be boiled. If sugar is present a red colour will appear. Keller advises that after boiling a little nitric acid should be added. If sugar is present the odour of caramel or molasses is detected.

(*b*) *Pettenkofer's Test* depends upon the action of gallic acid and sulphuric acid upon a solution of sugar. It gives to the urine, under such circumstances, a dark violet colour. On the other hand, the presence of gallic acid may be proved by the addition of a solution of

sugar and sulphuric acid. This test is not very reliable, and is seldom employed.

(*e*) *Trommer's Test.*—A certain quantity of the urine to be examined is mixed with excess of the solution of caustic potass, and a few drops of a solution of sulphate of copper are to be added. If sugar is present the fluid assumes an azure-blue colour. When warmed, boiled, or allowed to stand for a time, the oxide of copper is reduced to a sub-oxide, which is deposited in a red-brown powder. The reaction is made known by the yellow colour which the fluid assumes; the precipitate becomes red, and finally dark brown. If the fluid is heated still more, a thin, shining coat of copper is deposited on the walls of the test-tubes.

(*d*) *Boetger's Test.*—A solution of carbonate of soda or potass is added to the urine under examination. A little nitrate of bismuth is then added, and the fluid boiled. If sugar is present the oxide of bismuth falls as a black powder.

(*e*) *Löwenthal's Test.*—To the urine to be examined a mixture of tartrate and carbonate of soda and chloride of iron is to be added. If sugar is present the urine assumes a dark colour. This test is not very certain, as the fluid often assumes a dark colour when no sugar is present.

(*f*) *Raspail's Test.*—Urine containing sugar assumes a violet colour when sulphuric acid and albumen are added. This colour may also appear when no sugar is present; it is, therefore, an uncertain test.

(*g*) *Runge's Test.*—A small quantity of urine is poured on a plate, and a drop of sulphuric acid is added, and the plate warmed over a spirit lamp. If sugar is present a dark spot appears where the sulphuric acid was dropped. This test depends on the quality a saccharine fluid has when mixed with sulphuric acid—that of becoming black upon warming. Other organic bodies have the same property as sugar, and therefore this test is not sure. Reich recommends hydrochloric acid instead of sulphuric acid. The test has the same objection as that of Runge.

(*h*) *Maumené's Test.*—A woollen substance (merino) is moistened in a solution of chloride of tin and dried. If a drop of urine containing sugar is now placed on the merino, and then warmed, a dark spot appears. This test is very simple and convenient, as these pieces of merino are always to be had. This test also is not infallible, as other hydrocarbons besides sugar produce the same reaction.

(*i*) Another test for sugar is that of Cutton with chromic acid, which is reduced to an oxide of chromium when sugar is present. Instead of the original red colour of the chromic acid a green colour now appears.

(*j*) *Jones's Test* consists in allowing a drop of urine to evaporate, and then the deposit is to be examined for the crystals of sugar.

(*k*) *Zwenger's Test* depends on the quality nitrate of silver possesses, when heated to 212° F. in an ammoniacal solution of grape-sugar, of forming a bright metallic mirror. For this purpose some urine is evaporated; to the residue, after the addition of alcohol, water is added, and then an excess of nitrate of silver. The whole is then filtered, and the filtrate saturated with ammonia. In order to render the test more certain a small amount of nitrate of silver is again added, and the whole

is heated to 212° F. If a small amount of sugar only is present a blue mirror of metallic silver is formed. If no sugar is present the fluid is only clouded.

There are various methods of determining the quantity of sugar in urine; the simplest is that introduced by Dr. Roberts, of Manchester—a method which only requires an accurate pair of scales. The other methods require a great many instruments and test-fluids, among which are the polarimeter of Biot, the saccharo-meter of Soleil, the diabetemeter of Robiquet, &c. The test-fluids of Fehling are especially adapted for determining the quantity of sugar. The instruments of Biot, Soleil, and Robiquet, by a deviation of polarized light to the right, show very quickly and correctly the amount of the secretion of sugar. Every deviation of the ray of light one degree on the circular scale is made to correspond to one grain of sugar in a thousand grammes of fluid. According to Roberts's method no particular apparatus is required. The specific gravity of the urine to be tested is to be taken at the ordinary temperature of the sick room. Several ounces of urine are to be poured into a vessel, and a piece of solid yeast, the size of a hazel-nut, added. The vessel is then lightly stoppered, and placed in a warm room while fermentation proceeds. When this is completed, which generally happens in about eighteen hours, the fluid is allowed to cool to the temperature of the sick room, and allowed to clear up. It is then decanted, and the specific gravity again taken, when every degree of loss in weight represents one grain of sugar in an ounce of urine.

Dr. P. J. Hensley makes, in the 'St. Bartholomew's Hospital Reports,' vol. iii, some observations on Dr. Roberts's method of estimating diabetic sugar. He says that the determination would be much better if weighed than if estimated by the urinometer. For by the latter means error may be introduced—(1) By any soluble matter contained in the yeast. (2) No allowance is made for change of volume in the process of fermentation. (3) The urinometer never gives results as accurate as those afforded by the balance. He says that in several specimens of diabetic urine he has examined there has been a slight loss of bulk after fermentation. He, however, concludes that, taking the fluid ounce as that of the British Pharmacopœia, and the sugar as crystalline glucose, Dr. Roberts's rule gives a number slightly too great, but whose excess above the true number is less than its sixty-fourth part. This must be considered highly satisfactory.

In the same volume Dr. Dyce Duckworth makes some observations on the elimination of various matters by the kidneys. His results do not correspond with those of M. Corlieu and others. He shows that healthy kidneys do excrete the pigment of logwood and indigo, and that diseased kidneys may transmit odoriferous bodies. These facts, especially the last, were held by the observers referred to to indicate the line between health and disease in the renal structures. He is of opinion that in chronic albuminuria something more than mere transudation of serum is necessary to explain the occurrence of so much albumen in the urine. He is inclined to adopt Dr. Basham's view, viz. that it results from the

breaking down of badly formed cells, which are constantly being formed and constantly broken down.

Mr. J. D. Brown, of Haverfordwest, writes to the 'Medical Times and Gazette' (Jan. 25, 1868) an account of six cases of suppression of urine, in which he used digitalis with great success. He used it both internally and externally in the form of a poultice composed of bruised leaves. The fact is worth bearing in mind.

Dr. Miller, of Dundee, records ('Edin. Med. Journ.,' June, 1867) an interesting case of suppression of urine. The patient was a woman who had just been in the puerperal state, and who had exhibited slight marks of dropsy previous to her labour, but who had been brought to bed quite naturally. About three weeks after her confinement her water was found to be smoky, and to contain much albumen. Three days after she was worse, her urine very scanty, and there was a good deal of vomiting. Next day the urine ceased, and for thirteen days she lived without passing more than a few drops of urine. Nevertheless, she was conscious up to the last, and only once had a slight convulsion. Vomiting was excessively troublesome, and her bowels were kept freely open, which probably relieved her system. Everything which could be suggested was tried; digitalis was freely exhibited, cream of tartar given; cantharides, like the digitalis, was used both internally and externally, but with no good result. Dr. Grainger Stewart reported previous fatty change, with subsequent acute inflammation.

Dr. Roberts contributes to the 'Lancet' (May 23, 1868) two cases illustrative of two kinds of suppression of urine. The one is dependent on disease of the secreting substance, disturbance of the circulation or innervation, as in Bright's disease, the algide stage of cholera, or collapse of any kind. The other is caused by obstruction in the kidney or the ureter. The first case is that of a child, æt. 7, who had suffered from scarlatina. She was puffy, the skin dry, the stools frequent, dark and slimy, and there was frequent vomiting. Two drachms of urine had been passed in 24 hours; it was of a deep saffron colour, of oily consistence, and contained no albumen. Diaphoretics were ordered. Next day she was slightly better, but she did not continue to improve, and died in seven days from the beginning of the attack, during which time six or seven ounces of urine had been secreted, yet the patient died of pericarditis, not of suppression. The other case occurred in a man, æt. 67, who had first frequent calls to urinate, then scanty micturition, ending in total suppression, which lasted three days, after which, by the aid of judicious treatment, he was able to pass 20 ounces of urine. A good deal of urine, pale and limpid, was passed after this, but finally complete suppression supervened, and the patient sank. The right kidney was atrophied of old date, the left enlarged, dark, and containing bloody urine; a calculus was impacted in the lower portion of the ureters, and several others were also found. The bladder contained some limpid urine. Death from uræmia.

Dr. Roberts draws attention to the difference in the characters of the urine in the two cases. He shows that, as the kidney is a kind of forcing pump, when the pressure is on the side of the blood, and there is no resistance on the side of the uriniferous tubes, should this condi-

tion be changed, and resistance offered to the transudation of the fluid, it will be thin and watery, not dense and turbid. Colouring with blood is an adventitious circumstance.

Intermittent Hæmaturia.

In the 'Biennial Retrospect' for 1865–6 we noticed cases of this singular affection, which had been reported by Dr. G. Harley, Dr. Dickinson, Dr. G. Johnson, and Dr. F. Cock. There appears to be a substantial agreement as to the absence of any true blood from the urine, neither corpuscles nor colouring matter being recognisable. As regards the important matter of treatment, Dr. Dickinson affirmed the inefficacy of quinine, a medicine which might otherwise, from the periodic nature of the malady, have been expected to prove remedial. Dr. G. Harley, on the other hand, asserted that mercurials and quinine caused the disease to disappear rapidly.

Dr. Lionel Beale now comes forward with an opinion confirmatory of Dr. Harley's. He remarks that the pathological features of the disease seem to separate true hæmaturia from it as completely as that disorder is separated from gout, or jaundice, or congested liver. The casts which are found in the urine are not like those found in the various forms of kidney disease; the albumen (as shown by G. Harley) is not the albumen of blood-serum; and, on the whole, there is no reason to suppose that any true hæmorrhage occurs. The phenomena seem much more like those of aguish diseases; and although others have reported the failure of quinine, Beale has treated a case in which decided benefit was produced by 6-grain doses of that drug. In this disease there is, generally, evident hepatic derangement, and many circumstances point to the *liver* as probably more in fault than the kidneys. In some instances the malady appears to be connected with gout, a disorder doubtless partly due to disturbed liver-function. The brown colour of the urine may possibly be due to disintegration of blood-corpuscles in the liver (as blood accumulates in the hepatic capillaries) and subsequent elimination of them, in an altered form, by the kidneys. It must be borne in mind that brown granules are found in the renal cells in these cases, just as biliary colouring matter and solid brown and yellow particles exist in the cells in jaundice. It seems, therefore, more probable that the bulky brown product is secreted by the agency of the renal epithelium, than that it is a product of the disintegration of blood which had become stagnant in the capillaries of the kidney, or in the uriniferous tubes ('Practitioner,' August, 1868).

Abscess.

Dr. Gintrac, of Bordeaux, gives an account ('l'Union Méd.,' ii, 1867, 125) of a case of abscess of the left kidney bursting into the colon. The patient was a woman, æt. 48. In 1865 she had shiverings, and vomiting, with alternate diarrhœa and constipation. In 1866 she became worse, and she observed a large tumour in the left flank. She was thin and weak. The tumour was extremely sensitive; urine clear and healthy. This was on the 7th of February. On the 20th there were abundant

liquid stools, and the tumour sensibly diminished, but the belly was painful and the pulse small. The tumour lessened, but she grew weaker, and had hectic. She died on the 28th of February. The colon adhered to the kidney, and there was a communication between the two, or rather the cavity of the latter, for the organ itself had almost disappeared. It contained a thick cheesy material as well as pus. There was no calculus, and the ureter was healthy.

A case somewhat similar to the above was, last session, brought before the Clinical Society, by Dr. R. Southey, of St. Bartholomew's Hospital ('Clin. Soc. Trans.,' i, p. 58). The patient was a labourer, æt. 32, and had for some time required to have a catheter passed to secure free passage for his urine. This would seem to have induced a catarrh of the bladder, for which, indeed, complicated with other circumstances, he applied for relief. The bowels were confined, the urine scanty and highly purulent. There was much pain in the left flank and groin, where a deep-seated, smooth-outlined tumour, hard and painful, could be detected. From this the pain sometimes extended down into his thigh. The size of the tumour fluctuated with the quantity of pus in the patient's urine, as did also the pain, but, on the whole, the patient's condition did not improve, but rather the contrary, until the abscess was opened, which was done by Mr. Holden, by means of a trocar. This would seem, however, to have been done rather late in the day, for pus appeared, and for some time continued to appear, in the stools. Gradually, however, the patient improved; his urine became healthy, as did his stools, but he suffered a good deal of inconvenience, owing to dragging up of the bladder, due to the contraction of the abscess. Ultimately he went out quite well.

Dr. Southey thinks this abscess was rather nephritic than perinephritic. Against the latter notion he goes chiefly because there was no injury to the parts. That such is not necessary is shown by Dr. Bowditch's cases, and the series of phenomena would seem to be better accounted for by supposing the abscess to be outside the kidney, at least originally. We may conclude that in all such cases early operation is indicated, that they are not nearly so dangerous as might be supposed, and that a small and permanent opening is best adapted for voiding the contents with safety.

Dr. Henry Bowditch gives, in the 'Boston Medical and Surgical Journal' (July 9, 1868), some interesting details of three cases of perinephritic abscess, variously complicated, where incisions were made over the kidneys, and in which recovery took place. The patients were males, æt. 27, 29, and 38 years respectively. Their professions were physician, printer, and clerk. The disease began, in each instance, in the right renal and cæcal region, and was preceded by debilitating influences, and in two instances unusual physical exertion. The prominent symptom was pain in the renal or cæcal region, sometimes extending down the legs, and sometimes causing inability to walk. As a rule there was no disturbance of the alimentary canal, beyond slight obstruction, and the urine appeared to be healthy. There was no jaundice, peritonitis, or head symptoms. A rounded, doughy, and scarcely elastic tumour could be felt in the renal region. From this situation pus made its way

upwards behind the diaphragm into the pleura, giving rise to exceedingly severe symptoms in at least one instance. In one instance the breath was very fetid. The pulse varied, and there were many chills and night-sweats. The treatment was tonic, but the first thing to do good was the making of incisions, after which all the patients did well. The openings were very free, and in the case of one patient gave rise to severe and dangerous hæmorrhage. Dr. Bowditch seems to think smaller openings, as by a trocar and the employment of suction, would have been of benefit. The anatomical relations of the psoas muscles have an important bearing on such cases.

Mr. Spencer Wells contributes to the 'Dublin Quart. Journ.,' Feb. 1867, a valuable paper on the diagnosis of renal and ovarian tumours. The first case given was that of a child 4 years old, supposed to be the subject of ovarian disease. In this case the difficulty was not great; the tumour had grown very fast; it occupied the right side, and pushed the intestines downwards; it was elastic, but not fluctuating; besides, ovarian disease is rare in children of that age, encephaloid common. After death the kidney was found enlarged, but of the normal shape; its ureter was occluded; and as the other kidney was healthy, this accounted for the urine being normal. The second case was one of pyonephrosis of the right kidney, with two calculi impacted in the ureter. The patient was aged 50, had borne 5 children, the youngest being 17 years old. Since that labour, which was very protracted, she had been liable to pains in the back and right loin, coming on suddenly, with shivering, and thick turbid urine. After a time these attacks became more frequent; again they remitted, and again they recurred. She had passed several small stones. She fell one day whilst walking, and went home in great pain. During the next six days she passed a good deal of blood, and noticed the tumour, which was situated in the right loin. This, presenting fluctuation, was tapped, and a quantity of pus withdrawn. Pus now appeared in the urine; but the tumour again increased in size, and was again opened, and kept so; after a time the fluid passed was clear and contained urea, and the urine became clear. Ultimately the patient, after passing two uric-acid calculi, each the size of a broad-bean, completely recovered. The third case given was one of cystic degeneration of the left kidney, occurring in a married woman, æt. 43. The swelling was first noticed in 1854, and gradually increased, with occasional aching pains, the patient's health suffering a good deal till August, 1866, when, as the tumour impeded the breathing, it was tapped, and two gallons of dark-coloured fluid, the consistence of pea-soup, were removed. She remained well; but the cyst refilled, and on the 17th Dec. it occupied a great portion of the abdominal cavity. In front of it was a cord-like ridge, supposed to be either the intestine or a long and thick Fallopian tube. An operation was attempted, when the ridge was found to consist of the transverse and descending colon. A good deal of fluid was removed, but the attachments were too firm to admit of separation, and the wound had to be closed. Suppression of urine followed, and the patient died in thirty hours. After death clots and bloody serum were found in the peritoneal cavity. The right kidney was enlarged, friable, and pale; the calices

and pelvis were dilated, so as to form a thin case, which had given way longitudinally. The left formed a large cyst, constituting one large cavity, with several wide pouches formed of the distended structures of the kidney and its coverings. The cyst was closely united to the surrounding structures. Mr. Wells concludes—1st. That the intestine is most frequently in front in renal enlargements, behind in ovarian. 2. Tumours of the right kidney usually have the intestine on their inner border, those of the left are crossed by it from above downwards. 3. If the intestine be in front the urine should be carefully examined. 4. The determination of the intestine being in front may not be possible by percussion alone, but it has a peculiar feel when rolled. The patient may feel flatus, &c., passing along it, and it may be inflated by the rectum. The nature of the fluid discharged (if any) should be noticed, the history carefully sought out, &c.

Dr. Guipon ('Gaz. Méd. de Paris,' p. 19 et seq., 1868) also makes some observations on abdominal tumours. The first recorded case occurred in a woman, æt. 54. She exhibited a tumour in the epigastrium, which was supposed to be due to an implication of the stomach. It was, however, found that it depended on a cancerous degeneration of the lymphatic glands at the posterior portion of the abdomen. At the last the pylorus had been affected, but not to any great extent. A similar tumour was found in the neck, penetrating partly below the clavicle, and causing some effusion of serum into the pleural sac. Case 2 also occurred in a woman, æt. 62. She presented a tumour of the epigastrium, apparently connected with the stomach, and giving rise to uncontrollable vomiting. After death it was found to depend on extensive cancerous disease of the liver, a large mass being situated close to the epigastrium at the junction of the right and left lobes of the liver. The third case given is of still greater interest; it occurred in a woman, æt. 38, who had been frequently under medical treatment. She had a swelling in the left hypochondrium, which was sometimes larger, sometimes smaller; it gave rise to great pain, and she was frequently seized with vomiting. The matters brought up were dark and grumous, and, as the size of the tumour varied, it was supposed to depend on a cyst of some surrounding organ, discharging itself through the stomach. After death it was found that the stomach had been separated by a bridle into two parts—a larger one towards the left, the smaller towards the right. The separation was more marked internally than externally. There was also a number of ulcers, some of which had completely penetrated the walls of the liver, those behind being bounded by the pancreas. The great cul-de-sac contained black fluid, like that vomited, and had simulated the tumour. The blackened material was apparently blood from the ulcerations.

M. Kelsch ('Gaz. Méd. de Paris,' 1868, p. 360) narrates the following case:—An Arab, æt. 38, came into the Military Hospital of Constantine, having been ill for a month. He was extremely thin, his skin earth coloured, his abdomen enlarged, and covered with distended veins. There was great dyspnœa. Paracentesis was performed, and much serum escaped, and the man declared himself better. No liver could be detected by palpation, or in any other way. Iodine water was

thrown into the peritoneum, but no good followed; the fluid speedily accumulated again, and the man sank. The peritoneum was found to contain a good deal of clear fluid, with shreds of lymph gluing together its walls. The liver was in the middle of the body, between the crura of the diaphragm, very small (weight 1010 grms.), of a pale olive-yellow tint. When cut it appeared granular, and the connective tissue was abnormally abundant. The vessels were plugged and surrounded by layers of connective tissue. The whole vena porta, from its beginning, in fact, to its utmost ramifications, was found to be plugged, as was the spleen also. The venous plug was firm, yellowish, and closely adherent to the walls of the veins. In its interior the clot was at some points softened, and held a creamy liquid containing many leucocytes. The interior of the vein was rough, and irregularly thickened. In the splenic vein the clots were softer and redder. Other organs healthy.

Dr. Roberts, of Manchester, gives ('Brit. Med. Journ.,' June 13, 1868) some very interesting details as to a case of double hydronephrosis, ending in suppression of urine and intestinal obstruction. The patient, a gentleman, æt. 30, had been delicate from childhood, and had been subject to irregularities of the bowels, which, indeed, had compelled him to give up his occupation. There would be constipation for three or four days, after which there would be a free evacuation. Latterly these fits of constipation had become more frequent and more severe. When seen he was in one of them. The abdomen was distended and painful, and there was frequent vomiting. The urine was scanty. The bowels had not moved for five days, and had resisted all purgative medicines. The urine was dark red and bloody, sp. gr. 1008. The blood was in small granular masses, the size of a pin's head; there were no casts, but a good many epithelial cells. On examining the liver a distinct bulging could be perceived in both lumbar regions, these being elastic and slightly fluctuating. Double hydronephrosis pressing on the gut was suspected; but the difficulty was that after these repeated attacks there was no excessive flow of urine, such as is generally seen in these cases. Next day, the seventh of constipation, the bowels still remained unopened; only a very little urine was passed, but this was without blood. After twenty-four hours' suppression, on the 9th day a copious discharge of urine took place, amounting, in fact, to more than a gallon. It was only unnatural as to sp. gr., which was 1005—1007. The bowels were still unrelieved. The tenth day fully a gallon of urine was voided; and about midnight the bowels were opened, and an immense quantity of semi-liquid fæces had been passed. Next day the urine was suppressed, and the bulgings behind continued. The tongue was dry and the patient prostrate. On the twelfth day he died from uræmic poisoning, having passed no water for sixty hours. When the abdomen was opened two soft, lobulated, fluctuating tumours, representing the kidneys, were found in the lumbar region. The left one was ten inches long by seven broad, the right about a quarter less. To the bulging inner side of the left kidney the descending colon was firmly united by a broad attachment for about three inches. Here the intestinal obstruction lay, and here the mucous membrane was dark red, but not congested. On the left side the renal artery was normal; but the ureter, at its commencement, was

exceedingly narrow, so that only a fine probe could be passed through it. The entrance to it was also oblique and valve-like, which had evidently caused the accumulation. When the mass was lightly pressed no urine flowed, but when much pressure was used the obliquity vanished and the urine passed away readily. The lower portion was normal. When opened the kidney was found to be converted into a lobulated sac, the renal substance reduced to a thin layer a line or two lines in thickness, and covering the whole outer boundary of the sac. There were no traces of the pyramids. There was nothing to show how the narrowing of the ureters was produced. The right kidney was also sacculated, but not so much destroyed. The cause of the obstruction here was different; at its point of exit the ureter was crossed by an irregular branch of the renal artery (of which on this side there were two). This pressure, slight though it may have been, was sufficient, in course of time, to cause the sacculation. The kidney did not adhere to the intestine. The other organs were sound. Dr. Roberts cites from various authors a number of such cases.

Dr. A. R. Simpson contributes to the 'Glasgow Med. Journ.,' Jan. 1868, an elaborate paper on the subject of hydronephrosis, which he says may affect one kidney alone or both. His case illustrates the disease as one of childhood, not as gradually acquired, as in Dr. Roberts's case. The infant, when born, looked healthy, but its extremities were thin and its feet were clubbed. The walls of the abdomen were attenuated and flabby. It passed water after birth, and, although not strong, showed nothing very far wrong till the ninth day, when it refused to take the breast. After a few days its urine was noticed to have a disagreeable odour, and when sixteen days old it was found to contain pus; on the twentieth day it died. On examination the bladder was found to be hypertrophied, its mucous membrane rugose and vascular, at some points ecchymotic; it contained a teaspoonful of purulent urine. The orifices of the ureters were extremely narrow, hardly admitting the stilette of a blow-pipe, this narrowing being due to the thickening of the walls of the bladder. Outside, the ureters were swollen to the size of the small intestine, and folded on themselves, owing to their lengthening as well as dilatation. By pressure on these some of the same purulent urine could be forced into the bladder. The pelves and calyces of the kidneys were dilated, and the organs enlarged about one third, resembled cysts, with walls a quarter of an inch thick. They were lobulated, as fœtal kidneys ordinarily are, and cysts containing clear fluid were found on their surfaces and in their substance. These cysts were partially occluded and enlarged *tubuli uriniferi*. After alluding to the ordinary causes of this diseased condition, he proceeds to give some unusual cases. One was that of a young lady who had died of peritonitis. The right kidney was seen to be unusually large. On closer examination a band, formed of thickened peritoneum, was found to cross the ureter. This was probably the result of antecedent inflammatory action. This, of course, would in time have assumed, by the lengthening of the ureter, more and more of the valvular character, and so constituted an ever-increasing obstacle to the flow of urine. In another case a woman who had been supposed to be the subject of

dropsy was discovered to have the right kidney hydronephrotic. The only obstruction in this case also was a band of thickened peritoneum. It would seem that hydronephrosis is more common on the right side than on the left, and more frequent among women than among men.

Before the Royal Med. and Chir. Soc., May 12, 1868, Dr. Cooper Rose read a remarkable case of cystic kidney disease simulating ovarian dropsy. A young lady first noticed a tumour in the ovarian region when about 13. She menstruated somewhat irregularly, and occasionally suffered from hæmaturia. The tumour gradually increased till the skin over it was thin. A trocar was introduced, and sanguineous fluid removed. This opening remained patent for the rest of her life, giving vent to some purulent fluid. Gradually the tumour became smaller, but she sank, when it was found that the left kidney had been totally destroyed by a large cyst, which had been taken for an ovarian tumour.

Diseases of the Liver.

M. Sistach publishes an interesting case of abscess of liver treated by puncture and subsequent injection. After pointing out the difficulty of diagnosing abscess from hydatid tumour, he goes on to say that, on consulting recent authorities, he has been surprised to find that this mode of treatment has been recommended for special cases. After quoting the remarks of various foreign writers, he adds, "For ourselves, in spite of the silence of authorities on the point, we believe that we are fully justified in laying down the following conclusion. When the liver is high up, and has a reddened cutaneous surface, with superficial punctation, so that we are led to suspect an adhesion to the abdominal walls, puncture with the hydrocele trocar, and subsequent injection of iodine, may be adopted with great advantage. We prefer the trocar to the bistoury, because it enables pus to be drawn off more rapidly and safely, and also because it allows of the injections being carried into the depth of the pus-forming tissues, which have been previously washed with warm water." The iodine, he thinks, stimulates the walls of the abscess, and prevents the formation of pus ('Rec. de Méd. et de Chir.,' 103, 1868).

Dr. Philipson records ('Brit. Med. Journ.,' March 30, 1867) a case of secondary abscess of the liver. The patient had been ill three weeks. He was jaundiced, his tongue furred, bowels constipated, and urine tinged with bile. There was pain in the right hypochondrium, and the liver dulness increased. Three days after admission he had a rigor and became dilirious, and died three days after. The liver was filled with numerous small collections of pus, arranged along the line of the vena porta. On examining the spleen the source of the mischief was discovered, as it was converted into a cavity filled with fetid pus.

Professor Koster, of Utrecht ('Centralblatt f. Med. Wissen.,' June 11, 1868) writes on his experiments as to inflammation in the liver. These experiments confirm those of Cohnheim. The liver was irritated in a variety of ways. Two days after, the serous covering of the liver was swollen, dull, and, on transverse section, showed a number of

lymphoid bodies (pus-corpuscles), but without any indications that either the epithelium or the connective tissue had taken any share in their formation. The substance of the liver below the inflamed serous membrane showed liver-cells, swollen and granular, but no pus-corpuscles were to be found. By the third and fourth days pus was readily seen in the liver, where the inflamed and white coloured portions were becoming soft and easily broken. These sections, he found, showed in the interlobular connective tissue, empty blood-vessels, and in their walls a bulky collection of lymphoid cells, which were also to be seen, but in smaller numbers, between the cells of the liver. These liver-cells contained one or two nuclei, but in no respect were there indications of cell division or increase. Two days later the inflamed parts contained pus, although this was but scantily derived from the connective tissue or serous membrane. In this pus were ordinary pus-corpuscles, together with the products of altered liver-cells, as well as healthy liver-cells and fat-corpuscles. In the centre of the lobule, although the periphery was full of pus-corpuscles, were few or no changes. The central vein, when cut across, was empty, and in its periphery were the enlarged liver-cells, surrounded by plasma or a few lymphoid bodies. These rounded bodies Koster takes for white blood-corpuscles which have made their way through the walls of the vessels, as they do, according to his previous researches, in leukæmia.

Jaffe (ibid., April 11, 1868) directs attention to the spectroscope as a means of determining the existence of bile and urine-pigments.

Kusmaul ('Berlin Klin. Wochenschr.,' v, 12, 1867) narrates two interesting cases of suppurative hepatitis. In one case the patient, a man, æt. 68, began, in the winter of 1864–65, to complain of swelling of the feet; he had long suffered from a cough; he became worse and worse, finally applying for relief, was admitted into hospital, and was found to present all the indications of diffuse bronchitis. He soon after died, when he was found to have laboured under chronic bronchitis, with dilatations of the bronchi, but the base of the right lung and summit of the liver was found to contain a mass of pus, greenish in hue. In the liver it was confined by a thick cicatrix-like capsule, in the lung by dead lung-tissue. A dead cyst led the author to believe that the condition had resulted from hydatids. The other case was of still greater interest. A woman, æt. 52, had suffered from intermittent fever, and gradually became very low. Her liver began to pain her in 1865, but in 1866 she became worse; the pain was severe, and her abdomen became ascitic. On the 5th of February she vomited some black stuff, and died the same day. The right lobe of the liver was studded with numerous abscesses, the size of a nut, following the line of the portal vein. They seemed to have originated in the capsule of Glisson surrounding them. Small abscesses were also found in the mesentery, and in the cæcum and ascending colon, below their mucous tissue, in spots perforating the membrane.

Kusmaul, at the 20th page of the same article, narrates a case of what he calls blennorrhœa of the bile-ducts, with saccular dilatation of these—what we would call a case of gall-stones. The patient, a man, æt. 28, who had suffered from ague, was taken ill in the beginning of

October, 1862. He complained of lassitude, loss of appetite, vomiting, and constipation. He had much pain in the region of the liver, and had febrile attacks. He became jaundiced, and his liver was enlarged. After vomiting a quantity of dark blood he began to improve, but his condition varied until the end of January, 1864, when he was much as in 1862. The liver was very large, and there was fluid in the peritoneum. His urine was dark, his stools pale; he began to improve, but had a relapse in March, when he became worse than ever. His legs swelled, his lungs were affected, and he died of apnœa. In the cavity of the peritoneum was found a quantity of yellow fluid. The liver was fixed to the diaphragm and the colon, and in it were observed a number of small abscesses, filled with pus coloured with bile. These communicated with each other and with the bile-ducts. Each was lined by a special membrane. The gall-bladder was much contracted, and its cystic duct contained and held fast a facetted gall-stone. At the point where this joined the hepatic duct was another and much larger stone, which completely blocked up the channel, and had given rise to the mischief.

Dr. Christy Wilson records ('Edin. Med. Journ.,' Feb. 1868) a case of acute atrophy of the liver. The patient was a maid-servant, æt. 25, who, it seems, was in the habit of drinking spirits. She had been vomiting, and her urine was high coloured, her skin yellow, and her stools light coloured, when she was admitted into the Edinburgh Infirmary. When admitted her abdomen was flat, her skin bright yellow, and her urine green. She speedily became insensible and unable to eject the matters rejected by the stomach; her stools were light coloured, and she passed a good deal of blood both by the rectum and vagina. She entered the hospital on the 6th of December, and died on the 10th. After death there were found purpuric spots beneath the pericardium. The liver was diminished, and yellow in colour. The gall-bladder contained a little reddish-grey mucus. Other of the abdominal organs were fatty. The intestines were normal. The temperature in this case rose to 105° F., a rare occurrence, if, indeed, it has been before observed, in cases of acute atrophy of the liver.

Dr. Roberts, of Manchester, records a case of fungus hæmatodes of the liver ('Lancet,' Jan. 19, 1867) occurring in a girl, æt. 12. The swelling had been noticed four months before. There was bulging on the right side, extending upwards into the chest, and pressing on the subclavian artery, so as to diminish the pulse on the right side. Between the right costal margin and the umbilicus was most bulging, and there was fluctuation. The heart was thrust to the left, and the apex of the right lung was the only portion of it which acted. An exploratory puncture was made on the fluctuating spot, from which it was concluded that the disease was not hydatid, but malignant, with contained cysts. The girl gradually sank. There was no jaundice whatever, and little œdema. All the organs were healthy except the liver, the right lobe of which was converted into an enormous mass, on the summit of which remained the leathery and unaltered lung; the diaphragm, indeed, reached the clavicle. The morbid growth was encapsuled in a layer of liver tissue. The mass itself consisted of en-

cephaloid matter, chiefly in its lower portion, with hæmorrhagic masses and eight or ten cysts. The mass weighed about 8 lb.

Dr. Lancereaux contributes to the 'Gaz. Méd. de Paris,' 1868, p. 646 et seq., some interesting facts as to hepatic adenoma. He gives a variety of cases in which masses of hepatic cells have been found projecting from the surface of the liver, in the form of isolated masses in its interior, and blocking up the portal or sublobular veins. In each instance there was jaundice, with, in certain cases, owing to the venous obstruction, ascites, and sometimes anasarca. Lancereaux esteems it malignant in its character, and thus speaks of it:—"Distinguished by its anatomical characters and by its ordinarily rapid course, this lesion (circumscribed hypergenesis of hepatic cells) should be received into the group of cancerous affections, as much on account of the presence of a neoplasm in the bosom of the veins as on the invasion of the lymphatic glands by the product, a character which never belongs to cirrhosis. It is, then, only a variety of hepatic cancer of which the proper hepatic cells are the principal element. To this variety of cancer two others may be added—the one, the more frequent, has its origin in an alteration of the elements of the connective tissue, whilst the other is due to a hypergenesis of the cylindrical epithelium of the biliary passages. These characters do not apply to secondary cancer of the liver, for this always presents the characters of the primitive disease elsewhere developed."

Dr. Donkin gives an account of a case ('Med. Times and Gaz.,' Oct. 3, 1868) of death from the pressure of gall-stones on the vena portæ. (Ignatius Loyola is said to have died from a like cause.) The subject was a man, æt. 56, of robust frame and temperate habits. Three years ago his thigh had been amputated after an accident, which, of course, interfered a good deal with his active habits. On April 4th he went to bed, after a hearty supper, in his usual health, but was awoke about midnight with intense pain in the abdomen, accompanied with vomiting. The pain continued till the 10th, when he was seen by Dr. Donkin; there was then great tenderness over the stomach, and almost incessant vomiting of greenish fluid; immense quantities of this had been thrown up. The pulse was quiet. There had been no evacuation from the bowels since the attack, and the urine was suppressed. The patient gradually became worse, and died next day. A post-mortem examination showed the great omentum deeply congested, and blood-clots between its folds. Such also was the condition of the ascending mesocolon. The cæcum was highly congested; the ascending colon blackish from the same cause, the transverse colon less so. The stomach was much congested, and blood in some parts was extravasated; it contained a good deal of fluid, but the bowels were empty. The liver was healthy. The gall-bladder contained three large calculi, which it firmly embraced, so as to present a beaded appearance. It contained no bile, and posteriorly pressed upon the portal vein where it enters the liver. The muscular walls of the gall-bladder were atrophied, its fibrous coat thickened. The three calculi, placed end to end, measured 3 inches in length; the circumference of one was 3 inches, of another $2\frac{1}{2}$, of the third $2\frac{3}{4}$.

Dr. E. Hoffmann, of Bâle, narrates, in 'Virchow's Archiv,' xlii, pp.

222 et seq., a highly interesting case of contraction of the bile-ducts. The patient was a woman, æt. 63, who had for two months suffered from intense diarrhœa, loss of appetite, and weakness. Her legs were swollen and œdematous. Her pulse was feeble, 104. The liver reached the fifth rib; the spleen was not enlarged. The superficial abdominal veins were unusually full. In the right inguinal region was a hard lump, easily reducible, very painful on pressure. By and by the abdomen became tender and distended, vomiting came on, and she died nine days after admission into hospital. On separating the muscles from the ribs on the right side a quantity of orange-yellow, thick, mucous liquid escaped from a cavity, at the bottom of which was a quantity of green purulent material. This cavity lay between the muscles of the abdominal wall and the parietal peritoneum. It extended into the right iliac fossa, where it communicated with the cæcum, which was filled with a like materal. Above where the cavity touched the liver were six small holes, which communicated with a cavity in the substance of the liver, which was filled with yellow pus. Another cavity of a like nature was also found in this organ. The duodenum and colon were united to the liver, and the former communicated with the cavity of the gall-bladder. The ductus communis was completely obliterated. In the gall-bladder and duodenum were yellow masses of a mucous nature.

Stoffella, in the 'Oester. Ztschr. f. Prakt. Heilk.,' xiii, 46—48, extends Oppolzer's remarks on inflammation of the portal vein. Primary inflammation of this vein is rare; if occurring, the vein is usually atheromatous, or has been injured. Usually inflammation is secondary, following thrombosis. It may be compressed by the liver in cirrhosis, by syphilitic hepatitis, tumours of the liver, or dilatations of the bile-ducts. These give rise to coagulation, which gradually extends to the branches of the vein. Sometimes the small roots of the vein become inflamed, and the inflammation spreads by the formation of emboli in its branches. In this way the portal inflammation is explained when it follows on ulcers of the rectum, fistulæ, surgical operations on the rectum, inflammation of the bowels, especially of the cæcum, peritonitis, inflammation and abscesses of the mesentery, omentum, and mesenteric glands, from ulcer or cancer of the stomach, or from splenic or hepatic abscess. A common result of this pylophlebitis is pyæmia.

Pylophlebitis rarely ends in resolution, except the clot and the inflammation have been very small. Sometimes the vein is completely blocked, and then a collateral circulation, of a more or less complex character, has to be set up. The inflammation is, however, rarely adhesive; it is generally suppurative, and ends in abscesses of the liver, with pyæmia. The symptoms of the adhesive form are pain and tenderness over the liver. After arrest of the portal circulation there is ascites with gastric catarrh, and with enlargement of the superficial veins of the abdomen; enlargement of the spleen; and hæmorrhoidal swelling about the rectum, with frequent hæmorrhage from the stomach and bowels. The liver is diminished in size, but jaundice only follows when there is catarrh of the bile-passages. Death follows in weeks or months. The distinctions from cirrhosis are hardly appreciable, except it may be inasmuch as the onset of the disorder is much

more rapid. The suppurative form varies in character according as the pyæmia is primary or secondary. If the former, there will be the signs of pyæmia previous to those of the local affection, the prostration will be greater, and rigors more marked. In the latter there will be more pain of the liver, which will sometimes be found enlarged. The spleen is also affected, sometimes containing abscesses. Jaundice is noticeable in both forms. There are generally evidences of metastasis to the lungs or brain. This form of the disorder does not last as long as the other, and the difficulty of its diagnosis is greater.

Dr. Jeaffreson ('Brit. Med. Journ.,' May 30, 1868) mentions the case of a woman, æt. 53, who had long been afflicted with paralysis agitans. She had frequently suffered from pain in the belly. She never offered any indications of gall-stones, and she had never been jaundiced. She was suddenly seized with pain in the abdomen, and when seen had a pinched look, was very restless, and the breathing was thoracic. The belly was flat and very tender, and she vomited a quantity of dark green grumous material. Opium was given internally, and turpentine applied externally, but to no avail, for she sank in thirty-six hours. When the body was examined general peritonitis was discovered, the marks being strongest over the cæcum. The stomach was healthy, but the duodenum was firmly attached to the fundus of the gall-bladder, so that in separating them the former was torn. In the gall-bladder was no bile, but a quantity of gall-stones, some large, some small. Lower down the intestine, just above the cæcal valve, was a slough in the wall, the size of a shilling, corresponding to a sort of pouch in the gut, where a biliary calculus had lain, but which had escaped into the cavity of the abdomen. This, when recovered and taken along with another discovered in the gut, was found to represent a cast of three fourths of the gall-bladder. All the gall-stones were pure cholesterine. The author mentions a case occurring in his brother's practice, where a gall-stone was vomited owing to adhesion of the stomach to the gall-bladder, as was afterwards discovered. (The author thinks these calculi had become encysted, and thus given rise to sloughing, and so to peritonitis and death; but in accounting for the occurrence of such lesions just above the ileo-cæcal valve, it should never be forgotten that at this point the gut passes up from the pelvis to be on a level with the cæcum, and that collections of matter are apt to form at its lowest part.—Ed.)

Dr. Grainger Stewart ('Edin. Med. Journ.,' Feb. 1868) records a most interesting case of what he terms gastritis phlegmonosa, but which we rather prefer placing under the head of hepatic disease. The subject was a woman, æt. 26, who had previously suffered from gall-stones. She complained that she had not received a sufficient amount of food; and having changed her situation, she showed herself particularly fond of animal diet. She was seen by Dr. Stewart, and was then vomiting bile; this symptom proving troublesome, she was ordered effervescing draughts with ice, which did good for the time, but she did not improve, and she was sent to the hospital. There she was vomiting almost constantly. She had no purging, but her bowels were open. She complained of great pain in the abdomen, and there was much flatulent distension. Gradually she sank and died. She was not jaun-

diced, and there was no œdema. On opening the body the intestines were found matted together. The liver was large and congested, and in the gall-bladder was found an opening into the peritoneum. The gall-bladder was filled with calculi, and some were found in the hepatic duct. The walls of the stomach were thickened; on section pus escaped, mostly from the submucous tissue; the muscular coat was in some parts disorganized; the peritoneal coat was thickened, but there was no pus below the peritoneum; in the submucous coat it was in some places collected into sacs. Dr. Stewart concludes that the gastric disease was the primary affection; this, at all events, it is safe to doubt.

Enlargement of the spleen in children the subjects of congenital syphilis is seen, says Dr. Gee (paper read before the Royal Medical and Chirurgical Society, March 24, 1867), in about one fourth of the cases. Sometimes enlargement of the liver and other glands is superadded. The size of the spleen is a kind of index of the degree of the cachexy, and it can often be felt enlarged three years after the child has exhibited any other marked indications of the disease. Sometimes the enlarged spleen is the only sign observable. Enlarged spleens are sometimes found in children who are neither syphilitic nor aguish; they are then accompanied by great cachexia, and this, too, where leukæmia, lymphatic anæmia, rickets, idiopathic purpura, and primary disease of the liver, might be excluded. For such cases he proposed the term simple splenic cachexia. The analogy with Trousseau's adénie was pointed out. The statements were supported by the history of thirteen children, in all of whom the syphilitic history was undoubted.

Rupture of the liver, spleen, and left kidney, and death, sixteen days after an accident, is certainly very unusual, The case is recorded by Prof. Fayrer, in the 'Medical Times and Gazette' for May 18, 1867. The patient, a Hindoo, æt. 25, fell from a tamarind tree, and fractured both arms. On the 20th Feb., 1867, he was brought to the hospital, and appropriately treated; but the wounds did not do well, and he died in consequence of tetanus sixteen days after the event. There was no indication of internal mischief beyond a complaint of pain in the epigastrium the day after the accident, when uniformly bloody urine, without any clots, was passed. Next day the urine was also bloody, but there was nothing more till death. At the post-mortem the heart and great vessels were found to contain clots. The liver was studded with light grey pyæmic patches. On the posterior margin of the right lobe was a superficial rent, and two others on the under surface. The spleen had two ruptures in its posterior edge, the upper one very deep. At the upper end of the left kidney was a rupture running into the hilus, where the areolar tissue was infiltrated with blood. A great part of this kidney was softened. Two ounces of blood-clots lay in the great omentum, and there was some coagulated blood over the kidney and left side of the pelvis. There was no peritonitis. The peculiar condition of the liver Prof. Fayrer attributes to emboli from the ruptured spleen.

Dr. Hjaltelin ('Edin. Med. Journ.,' Aug. 1867) reports most favorably on the use of tincture of kamala in the treatment of hydatid cysts in the liver. This disease is extremely common in Iceland, and

he recommends the tincture as an efficient remedy in many cases. When not suitable, he seems to prefer the bistoury in opening the cysts.

Other papers on diseases of the secretory organs:

Ranse, C., case of suppurative hepatitis ('Gaz. des Hôp.,' 77, 1867). Hoffman, adenoma of the liver ('Virchow's Archiv,' xxxix, p. 193, 1867). Bressy, biliary tumour formed in the bile-ducts ('Arch. Gén. de Méd.,' ii, 1868, p. 318). Flack, gall-stones treated by chloroform, successfully ('Med. Times and Gaz.,' Aug. 10, 1867). C. R. Thompson, gall-stones treated by subcutaneous injection of morphia (ibid., Aug. 17, 1867). A. Leared, albuminoid precipitate in the urine (ibid., October 26, 1867). W. J. Trentler, acute hepatitis, with double pneumonia (ibid., Sept. 26, 1868). J. C. Thorowgood, malignant disease of the kidneys (ibid., Nov. 7, 1868). H. Buss, misplaced spleen and the hæmorrhagic diathesis (ibid.). E. L. Fenn, congestion of the liver (ibid., Dec. 12, 1868). Bourdillat, hydatids of the liver; death from pleuro-pneumonia ('L'Univ. Méd.,' i, 1867, p. 611). Gouraud, perinephritic abscess (ibid., ii, 1867, p. 483). Gueneau de Mussy, floating kidneys (ibid., p. 512). Ferrol, hydatids infiltrated in the liver and in the lung (ibid., iii, p. 493). Ferrol, nephritis; uræmia; death (ibid., iv, pp. 174 and 326). Veale, on urinary pigments ('Edin. Med. Journ.,' Dec. 1867). Murchison, diseases of the liver. Lectures ('Lancet,' March 16 et seq., 1867). Johnson, pathology of the liver and kidney. Lecture (ibid., Aug. 24, 1867). Helm, albuminuria in a child seven weeks old (ibid., Jan. 18, 1868). Nelson, chronic albuminuria and its ferro-albuminous treatment (ibid., Feb. 8 et seq., 1868). Iliffe, ascites, with an unusual quantity (80 pints) of fluid (ibid., March 14, 1868). Ward, abscess of the liver (ibid., Aug. 1 et seq., 1868). Wasdale Watson records the case of a girl who had been ill for some time, had had epileptiform fits, and had passed blood by stool. She was discovered dead, having fallen out of bed in what is supposed to have been an epileptic fit. A pin was found perforating the walls of the stomach from its interior and piercing the liver half an inch deep ('Lancet,' Oct. 10, 1868). Johnson, diarrhœa and vomiting the result of renal disease ('Brit. Med. Journ.,' April 27, 1867). Ikin, malignant tumour connected with the kidney (ibid., June 8, 1867). Whittle, renal diphtheria ('Dublin Quarterly,' Nov. 1867). Kelly, urea and uric acid ('Med. Press and Circ.,' July 22, 1868). Guibout, perinephritic abscess ('Gaz. des Hôp.,' 1867, p. 333).

G. SKIN DISEASES.

Mr. Jonathan Hutchinson, in a valuable paper contained in the 'London Hospital Reports' for 1867, and which we are sorry want of space forbids us to quote at greater length, gives the following valuable synopsis of doctrine. In order to succeed in the cure of skin diseases, we must be prepared to act promptly and energetically in the following articles of creed:

(1) That the itch insect is the real cause of scabies.

(2) That a vegetable parasite is the real cause of favus, ringworm, and tinea versicolor.

(3) That most inflammatory products are contagious, and can induce, if applied whilst living to healthy tissues of the same kind as those which furnishes them, a similar form of inflammatory action.

(4) That the contagion of recent and living pus formed by the skin is a very common cause of skin-inflammations, and may induce them as well in the same patient as in others.

(5) That inflammations of the skin spread in extent by the contagion of continuity, *i.e.* by cells produced by inflammation coming in contact with those as yet healthy.

(6) That to prevent or put an end to the contagion of inflammatory products, all that is necessary is to destroy their vitality.

(7) That the vitality of inflammatory products may be destroyed by various forms of escharotics and caustics, and that it may be greatly modified by other means which stop short of destruction of tissue.

(8) That mercury, iodine, and arsenic, possess marvellous powers in modifying the vital properties and tendencies of inflammatory products.

(9) That mercury is efficacious against almost all forms of the inflammatory process, provided it be used in doses sufficiently reduced not to disturb the patient's health.

(10) That mercury is efficient in procuring the resolution of inflammation, whether applied locally or introduced into the blood, and then, when circumstances allow, its local use is much safer, and permits of a cure being accomplished with a much smaller quantity.

(11) That mercury possesses special efficacy against the forms of inflammation which occur in consequence of syphilis, especially those met within two years of the contagion (secondary).

(12) That the salts of iodine possess special efficiency against syphilitic inflammations, especially those which occur many years after contagion (tertiary).

(13) That a large number of skin diseases are local from beginning to end, and are to be influenced only by local treatment—the three forms of tinea, scabies, molluscum contagiosum, porrigo, prurigo pedicularis, many forms of eczema, &c.

(14) That many other skin diseases are local in origin, but affect the constitution afterwards, and require for cure both local and general treatment—erysipelas, many forms of eczema, many forms of prurigo.

(15) That some skin diseases of constitutional origin are yet chiefly susceptible of treatment by local remedies—lupus, carbuncles, boils.

(16) That there is really some peculiar state of health which we cannot yet define, which renders its subject liable to general eruptions of different forms, which are always symmetrical, always liable to relapse, usually met with in the young, and always more or less definitely under the influence of arsenic. To this state of health the French have given the name of dartrous diathesis. It accounts for common psoriasis, many forms of eczema, lichen, and pityriasis, common pemphigus, and many forms of lupus.

(17) That the "dartrous diathesis" may be complicated by others, as, for instance, by the presence of a syphilitic taint.

(18) That nearly all inflammations occurring in the lower extremities are much influenced by hydraulic conditions, which must be always kept in view in the treatment.

Dr. Clifford Allbutt ('St. George's Hospital Reports,' vol. ii), writing on the value of skin affections in the classification of skin diseases, starts off with the following propositions:

(1) That classification in the study of disease is not a technical system, but is the expression and the organ of our progress in investigation; to classify being to formulate the phenomena of natural evolution as we perceive them.

(2) That life, as it falls under the eye of the physician, consists in a

series of processes which together constitute modes of growth, and that these modes are many—*e. g.* scrofula, rheumatism, health, syphilis, tuberculosis, rickets, and so on.

(3) That "morbid" states, taken severally, such as bronchitis, meningitis, lichen, eczema, heart diseases, kidney diseases, &c., are most frequently terms or members of such series; their serial connection being, however, often overlooked, and they themselves regarded as self-consistent disorders.

(4) That these series are themselves again capable of comparison, and, as in the case of scrofula and rheumatism, for instance, are often curiously related.

(5) Classification by the natural method must be founded, therefore, on a perception of these serial relations, and on the natural affinity they reveal, and must, indeed, be the expression of them. An artificial system, on the other hand, will be based on separable attributes of size, locality, appearance, duration, &c., which cannot necessarily be distinctions of kind.

(6) Finally, then, the study of skin diseases is especially fitted for the working out of such a natural method as this, and is deserving of much attention.

Speaking of the exact condition of our knowledge of skin diseases, the same writer says, "We are thus far, then, in our efforts of constructive grouping:"

(1) We have classed in families and named our elementary lesions, such as ulcers, vesicles, &c., though, of course, each family contains many varieties.

(2) We have noted their varying relations to each other, and we have made groups in accordance with observed modes of such variations—eczema, lichen, psoriasis, &c. There remain yet two efforts of synthesis to be made.

(3) To ascertain whether these affections have a place in the evolution of general maladies, and if so, what place and what specific names they are to receive in accordance therewith.

(4) Last, and also least, we have to note varieties.

To illustrate these directions of thought, Dr. Allbutt next selects a case of that common affection, eczema.

A. B—, æt. 63, whose father suffered from gout, and died of effusion of blood into the brain, presents himself with a large eczematous patch upon the outer side of the calf of the left leg. He says that the patch sometimes disappears, but it always returns in the same place, and on each reappearance it exudes a little clear fluid. When the affection of the leg recedes he often suffers from bronchitis. During adult life he has been liable to acid eructations and to turbidity of urine, also for many years to piles. He is liable also to dizziness in the head, to low spirits, and to intercostal neuralgia. Never had a frank attack of gout. There are nodules in the edges of the ear; the arteries are a little rigid to the touch, and the second sound of the heart is a little too clear and loud. The urine is generally of low specific gravity, and contains traces of albumen. On examining the eczema we find, not a pink, creeping, sweating, and itching patch, but a claret-coloured, fixed, dry,

and stinging one. There are now no vesicles, but a few papules, and considerable desquamation. There is little itching, but much smarting. There is no symmetrical patch on the other limb. To follow the order of thought stated above, we (1) name the lesions, a simple matter in this case. (2) We know by the look of the patch, and by inquiry, that it is the chronic stage of a once active process, which active process at its phase of *greatest activity* was marked by vesicles on an inflamed surface, this form of eczema having a very brief period of culmination and a very prolonged period of subsequent chronicity. This subsequent period is often marked by squamo-papular elements. Such an anatomical development I call eczema, after Willan. (3) We have to go a step further, and ask whether the connection of the eczema with the other affections in this person and his family is an accidental or an essential connection. Now, eczematous affections occur in the course of the scrofulous series, of the arthritic, of the dartrous, and also from the effects of certain parasites, certain irritants, &c. Can we by any peculiar features recognise specific differences among these eczemas of various origin? I think we can. Where the scrofulous skin gives way in eczematous modes it is rather on the upper than on the lower parts of the body; it does not sting much; it does not go and come in one spot, but spreads rather rapidly; it generally comes and goes once for all, and it does not occur in adult life. It does not dry up and form scales, but secretes a sero-purulent fluid, which tends to form crusts. The dartrous person, again, is very liable to eczemas among other degenerations of the skin. But in them the eczematous form of morbid evolution differs widely from either of the preceding. It tends to spread rapidly, and also symmetrically on both sides of the body. It is seldom complicated with papules, though it often is with superficial ulcers and with scales. It is of a pink, not a claret colour; it runs freely with a clear exudation, which does not form horny crusts. It may smart a little, but generally itches. It has no tendency to recur in a circumscribed spot, but it generally prefers the inner aspect of the limbs. I will not proceed to point out the peculiarities of syphilitic eczema, as these are said to be well known.

Dr. Handfield Jones ('Brit. Med. Journ.,' March 9, 1867) records the case of a clergyman, æt. 64, who had been during two years melancholic. From this attack he recovered, but was soon after attacked with a reddening and pruriginous itching near the left ankle. The veins were varicose, but the health was good; ultimately the pain and itching became so intolerable as to be hardly bearable, even with powerful anodyne applications, as lint soaked in strong infusion of tobacco, sometimes with opium and large quantities of hydrocyanic acid. The surface was bright red, covered by a thin cuticle, through which innumerable papulæ could be seen. Latterly faintness after eating came on, but the mind was all the time perfectly sound. One morning his medical attendant was hastily summoned, who found him wildly excited and irrational in his talk, but the prurigo was gone. The previous evening he was itching as usual; in the morning the skin was only slightly red, and he said it was quite well. He gradually became melancholic, but the eruption never returned.

Dr. Hilton Fagge ('Guy's Hospital Reports,' 1867) contributes some remarks on keloid scleriasis and morphosis. He first of all distinguishes between the keloid of Alibert and the keloid of Addison, and enters into a discussion of that vexed topic, the origin of the term. He considers this disease as identical with that described by foreign writers as scleriasis. He shows that the raised and ivory-like portions of the skin may recover their elasticity and their normal texture, if not their colour, in certain instances.

Other papers on diseases of the skin:

Tilbury Fox, notes on the dermatology of Egypt ('Med. Times and Gaz.,' i, 1867, p. 113 et seq.). Balmanno Squire, animal parasite diseases of the skin (ibid., i, 1868, p. 466). Balmanno Squire, syphilitic pemphigus (ibid., ii, 1868, p. 261). Balmanno Squire, treatment of psoriasis (ibid., p. 446). Tilbury Fox, neglect of the study of skin diseases ('Edin. Med. Journ.,' Feb. 1867). Guibout, difficulty of diagnosis in skin diseases ('L'Union Méd.,' ii, 1867, p. 313). Voelcker, blue coloration of lint used for wounds (ibid., iv, p. 20). Gougenheim, sporadic pellagra (ibid., iv, p. 344). Rasmussen, sclerodermia ('Edin. Med. Journ.,' Sept. 1867 et seq.). M'Call Anderson, eczema marginatum (ibid., May, 1868). M'Call Anderson, sycosis menti (ibid., June, 1868). Hilton Fagge, diagnosis of scabies ('Lancet,' April 4, 1868). Chaplin, leuce (ibid., May 23, 1868). Prior, porrigo favosa treated by carbolic acid ('Brit. Med. Journ.,' Oct. 26, 1867). Cockle, elephantiasis arabum (ibid., June 6, 1867). Basham, on some forms of skin diseases (ibid., Oct. 10, 1867). Axford, treatment of eczema. Purdon, notes on herpes, pemphigus, and urticaria ('Dub. Quart. Journ.,' May, 1868). Erasmus Wilson, many papers and lectures ('Quart. Journ. of Cutaneous Medicine'). Tilbury Fox, eczema ('Lancet,' ii, 1868, pp. 663 and 692). Erasmus Wilson, a specimen hair exhibiting certain changes in structure, the result, he believed, of syphilis. Hulke, case of ichthyosis glossæ. Purdon, notes on acne rosacea ('Medical Press and Circular,' June 10, 1868). C. B. Nesterton, treatment of acne rosacea ('Schmidt's Jahrb.,' 137, p. 179). J. Hughes Bennett, treatment of skin disease ('Practitioner,' Oct. 1868). Sidney Ringer, glycerine of tannin in skin diseases (ibid., July, 1868). Anstie, herpes ('Reynolds's System of Medicine,' ii, 1868). Prouet, herpes and erythema dependent on morbid state of the nerves ('Arch. de Médecine,' Feb. 1869). Damon, herpes ('Neuroses of the Skin,' Philadelphia, 1868). Pincus, alopecia pityroides ('Virchow's Archiv;' 'Practitioner,' Aug. 1868). Tilbury Fox, the kerion of Celsus ('Lancet,' Feb. 1, 1868). Tilbury Fox, contagious impetigo (phylctenodes) (ibid., Aug. 10, 1867). Tilbury Fox, the diagnosis of scabies (ibid., May 18, 1867).

[The Editor regrets that a mass of material prepared for the report on skin diseases has unavoidably been omitted, owing to want of space. It should, perhaps, be said that, in selecting the matter contained in the preceding report, the Editor has with rare exceptions drawn it from the evanescent sources of journalism, rather than from the more permanent and, therefore, more readily attainable records preserved in volumes of reports, lectures, &c.—Ed.]

REPORT ON SURGERY.

BY

T. HOLMES.

The following extracts refer to new inventions in surgery, or to the reintroduction of methods of treatment which had previously fallen into oblivion.

New Anæsthetic Agents. Nitrous oxide.—Of late the nitrous oxide (laughing-gas) has been introduced and extensively used as an anæsthetic. We extract the following account of its supposed physiological action from the 'British Medical Journal,' April 18, 1868. "In two papers published about four years ago, Dr. Hermann arrived at some interesting results touching the physiological action of nitrous and nitric oxide. (Reichert, Du Bois Reymond's 'Archiv,' 1864, p. 521; 1865, p. 469.) From these researches it would appear that, while laughing-gas is very readily absorbed by blood, it neither enters into combination with, nor produces changes in, nor suffers changes from, the action of blood. It is now generally believed that the oxygen present in blood exists in a peculiar loose combination with the blood-corpuscles, and is not retained by simple physical laws of absorption. Laughing-gas, on the contrary, is merely physically absorbed, and blood will take up rather less of it than it will of water. That is to say, 100 volumes of blood will, at the temperature of the blood, absorb somewhat less than 60 volumes of laughing-gas. Blood saturated with laughing-gas shows no sign of change; the spectrum appearances are the same; the blood-corpuscles are unaltered; and, according to Hermann, the oxygen is not driven out. In the blood, and probably in the body, laughing-gas suffers itself no change. It does not give up its oxygen for purposes of oxidation, as Sir Humphry Davy thought. It gives rise, therefore, to no free nitrogen; but goes out of the body, as it comes into the body, pure and simple laughing-gas. Hence it is itself of no respiratory use; and, when mixed with a quantity of oxygen sufficient for the needs of the economy, has no more *direct* effect on respiration than has nitrogen or hydrogen.

"From these facts we may gather that the mode of action of laughing-gas is that of a body having distinct effects on certain parts of the system, and does not depend, like that of some other agents, on any direct interference with the function of respiration. Readily absorbed by blood, and yet with its limit of absorption soon reached; passing

away from the blood into a pure atmosphere as quickly as it passed into the blood from the receiver in which it was previously confined; suffering no change itself, and causing no obvious gross chemical changes in the fluids or tissues of the body; it certainly seems peculiarly fitted as an agent for producing temporary conditions of the economy. On the muscles and hearts of frogs it has no more effect than nitrogen or hydrogen."

The writer then goes on to contrast with this the action of the nitric oxide, which is excessively greedy of oxygen, and therefore at once robs the blood of all its free oxygen.

In the same journal ('Brit. Med. Journ.,' April 25, 1868) is an account of the administration of this gas for a few minor operations (all of very short duration) at St. Bartholomew's, accompanied by the following opinion from Mr. Paget:—"After seeing Mr. Coleman give the nitrous oxide at St. Bartholomew's, I cannot doubt its sufficiency for procuring total insensibility to the pain of short operations. The appearance of asphyxia is alarming; but it is so brief that one may believe that, even if it were more profound, it might do no harm. The question of danger, however, can only be decided by the results of some thousands of cases. There is certainly great need of improving the means of administration. With an apparatus so cumbrous as that which Mr. Coleman has to use, it would be impossible to employ the nitrous oxide largely in general practice."

In the same paper ('Brit. Med. Journ.,' April 25, 1868) is the following report of a discussion on this subject at the Medical Society of London:—"At a meeting of this society, on April 13, Mr. Hunt drew attention to the use of nitrous oxide as an anæsthetic, which had been urged upon the profession.—The President considered that nitrous oxide was no true anæsthetic, but an asphyxiating agent. It did not diffuse into the blood, but prevented the normal oxygenation; its action upon animals was rapidly fatal. It could not be other than a dangerous agent, and its employment was a retrogression in science.—Dr. Sansom greatly agreed with the President. Nitrous oxide had been formerly tried and found wanting; it was an asphyxiating agent, and no asphyxiating agent could be a mere negation; for whenever there was deficient oxygenation of blood there was always accumulation of the products of disintegration which were in themselves poisons. Nitrous oxide was greatly inferior to chloroform, both as to its management and its prospects of safety."

Dr. Sansom further develops his objections to nitrous oxide in a letter to the same journal (May 9, 1868) in the following terms:

"First. Inasmuch as anæsthesia is a boon for the many and for the moment, I think there is an inherent *à priori* objection in any agent which is gaseous or requires cumbrous machinery for its administration.

"Secondly. The action of nitrous oxide is excitant (sometimes to the extent of producing a condition in which the subject becomes unmanageable). It produces effects which are singularly various in different individuals. Its phenomena have a complete analogy with those of asphyxia.

"Thirdly. Its action is complicated by grave dangers. It is impossible

to ignore the fact that not only several fatal cases have followed its employment, but that a jury in the United States appended to their verdict in one of these cases a dictum against its indiscriminate use. Moreover, it is certain that remote ill effects have followed it. I myself have the testimony of Dr. Eade, of Barnsbury, who attended a case in which epilepsy and delirium for several days followed its administration." (On these points, also see Mr. S. L. Rymer, in 'Dental Review' for Jan. 1864; Dr. Ziegler, 'Dental Cosmos,' Dec. 1863; Mr. R. Hopgood, 'Dental Review,' 1864; and Pereira's 'Materia Medica.')

In the same journal ('Brit. Med. Journ.,' March 9, 1868) Dr. Marcet, after some observations on the interchange and diffusion of gases through moistened membranes (such as the pulmonary membrane), proceeds as follows to explain the action and relative safety of the nitrous oxide:—"If we now turn our attention to the physiological action of protoxide of nitrogen, from a consideration of the above remarks, its presence in the pulmonary vesicles cannot in any way be opposed to the elimination of carbonic acid from the blood circulating through the lungs; it will become dissolved by the moisture adhering to the air-vesicles, and carried by liquid diffusion into the blood. The solubility of nitrous oxide in water is much higher than that of oxygen; consequently it will find its way into the blood much more rapidly than oxygen would. Water at 68 deg. F. (a temperature inferior to that of animal heat), for one volume of oxygen supplied to it in air, will absorb no less than 37 volumes of oxygen supplied to it as nitrous oxide; this will give an idea of the relative degree of absorption of oxygen by a moist membrane, such as that of the lung, from air, and in the form of nitrous oxide. These considerations appear to me to show that the action of protoxide of nitrogen on the human body is due, first, to an increased supply of oxygen to the blood, causing the well-known early exhilarating effects; and later, when a larger quantity of the gas has been absorbed, anæsthesia is produced by the excessive formation of carbonic acid in the blood owing to a large supply of oxygen. When the gas is exhibited diluted with air to a certain point, the exhilarating effects do not pass off into insensibility, because the carbonic acid is eliminated as fast as it is formed; but when given undiluted with air, its anæsthetic influence becomes quickly developed. The rapid disappearance of the blue stage, and return of sensibility, appears due to the fact that, according as the access of carbonic acid in the blood is withdrawn from it by the respiration of pure air, the oxygen of the nitrous oxide absorbed, becoming present in the blood in excess of the carbonic acid, causes an immediate renewal of the vital functions, allowing time for the absorption of oxygen from the air inspired. If this view should be correct, it would follow that nitrous oxide is a safe anæsthetic agent when required only for a short time, and even when administered for a protracted operation, care being taken to allow the occasional respiration of pure air, so as to get rid of the excess of carbonic acid formed, supposing, of course, that nitrous oxide is not possessed of any special anæsthetic property."

A report has very recently been made to the Odontological Society on the action of this anæsthetic by a committee appointed for that

purpose, from which the following is extracted ('Brit. Med. Journ.,' Dec. 12, 1868) :—"From experiments upon various lower animals, they arrived at the conclusion that it was free from atmospheric air, a powerful anæsthetic, more rapid in its action, although more evanescent, than chloroform and other anæsthetics; and that although, if pushed, it produced death, still the animals were often speedily brought round, when apparently dead, by the admission of air.

"They next proceeded to arrive, if possible, at the conclusion whether, as an anæsthetic in man, it was as safe as, or safer than, those in general use. To this they give a guarded answer for the present, stating, however, that it is at least as safe, for short operations, as any other anæsthetic.

"They next enumerate the conclusions arrived at, founded on 1380 cases watched and carefully reported on by the various members of the committee, and on 1051 reported to them on trustworthy authority, as to the advantages and disadvantages of the gas. The advantages are, shortly, these—the rapidity of its effects in producing anæsthesia, the shortest time being 25 seconds; rapidity in recovery; its agreeable nature; its being tasteless and less irritating; almost entire freedom from nausea and vomiting, occurring in less than 1 per cent.; absence of headache and vertigo, as a general rule, after complete recovery from the anæsthesia. The disadvantages are noted as consisting in its unsuitableness for long operations, on account of the rapidity of recovery; in the difficulty of making and transporting the gas, and also the expense of the agent; in its being troublesome to make, and requiring unusually complicated apparatus in its administration; in the undesirability of quick recovery in operations followed by much pain; in the administration being occasionally accompanied by twitchings, which render it unsuitable for delicate operations."

In the 'Lancet' (May 11, 1867) and in the same journal (June 1, 8) will be found papers and experiments, by Dr. Protheroe Smith, on the preparation and use of the tetrachloride of carbon as an anæsthetic, with experiments on the lower animals, and notes of cases in which it was used in practice.

In the 'Med. Times and Gazette,' Nov. 2, 1867, is a paper, by Dr. Richardson, "On the Properties and Use of the Bichloride of Methylene as an Anæsthetic." After describing the mode of its preparation, and some experiments illustrating its action, Dr. Richardson thus describes its administration:

"When I had learned by repeated experiments that the bichloride of methylene could be safely administered to inferior animals, I inhaled it myself until it produced insensibility. I found the vapour very pleasant to breathe, and little irritating, while drowsiness came on and unconsciousness without any noise in the head or oppression. I recovered also as the animals seemed to recover—at once and completely. I felt, in fact, as though I had merely shut my eyes and had opened them again. In the mean time, however, I had performed certain acts of a motor kind unconsciously; for I had inhaled the vapour in the laboratory, and there went into sleep, but I awoke in the yard adjoining. This was on September 28 last. I inhaled on the occasion from a cup-

shaped sponge. Since then I have inhaled the vapour in smaller quantities from several instruments, with the effect of proving that there is little difference required for the administration between the bichloride and chloroform. The bichloride may be inhaled from a moist sponge, from a balloon or Clover's bag, or from a funnel such as this, made by stretching a few layers of thin cloth over a small wicker work, such as is used for surrounding a flower pot, and which opens or closes to any size that may be required. A metallic inhaler such as Snow's chloroform inhaler presents too small a surface for evaporation. In the course of administration a little more bichloride of methylene is required in the earlier stages than would be required if chloroform were being used, the fluid being more easily vaporisable, and the loss greater. One drachm of bichloride to forty grains (or, in common phrase, minims) of chloroform is a fair statement of the difference required; but when the narcotism is well set up less of the bichloride is needed, in animals, to sustain the effect, the repetition of the administration not being so frequently demanded."

The following are the conclusions to which he comes:

1. It is an effective general anæsthetic, producing as deep insensibility as chloroform.

2. In action it is rather more rapid than chloroform, but to develop effects more of it is required, in the proportion of six parts to four.

3. It produces a less prolonged second degree of narcotism than other anæsthetics.

4. When its effects are fully developed, the narcotism is very prolonged, and is reproduced with great ease.

5. Its influence on the nervous centres is uniform, and it creates little, if any, disturbance or break of action between the respirating and circulating functions.

6. Its final escape from the organism is rapid, so that the symptoms of recovery are sudden.

7. In some cases it produces vomiting.

8. When it kills it destroys by equally paralysing the respirating and circulating mechanisms.

9. It interferes less with the muscular irritability than perhaps any other anæsthetic.

10. It combines with ether and with chloroform in all proportions.

"Since the lecture above written was delivered I have been enabled to test the action of the bichloride of methylene on the human adult subject in five long and severe operations. Four of these were cases of ovariotomy performed by Mr. Spencer Wells, and the period of narcotism in each case averaged from thirty-five to forty-five minutes. In all the cases, except one where Weiss's inhaler was used, the anæsthetic was administered from a simple mouthpiece made of a layer of parchment paper stretched over a light frame of wood, and lined on the inner surface with lint. The quantity of bichloride of methylene used in each case averaged a little more than a fluid drachm each five minutes, two drachms being first used. In all the cases the administration has been safe, and the recovery from the effects of the narcotic good. I noticed specially that in each case the transition from the

first to the third degree of narcotism was very brief; that when the anæsthesia, which was complete in an average of five minutes, was well established, it was easily prolonged for six, and even seven minutes, without readministering the vapour, and when recovery began to show itself very brief readministration quickly reproduced the insensibility. In one case after the operation the patient continued twenty-seven minutes in unbroken sleep, and then awoke with entire consciousness.

"It happened that one of the ladies to whom I gave the anæsthetic had once been under chloroform, Dr. Snow having been the administrator. This lady was therefore able to compare the effects of the two agents, and she gave her verdict strongly in favour of the bichloride."

Antiseptic treatment by carbolic acid.—In the 'British Medical Journal,' Sept. 21, 1867, and in the other London medical papers of the same date, will be found a paper read by Prof. Lister, of Glasgow, before the meeting of the British Medical Association at Dublin, on Aug. 9, 1867, and which contains the details of the treatment of wounds and abscesses by the application of carbolic acid, which was noticed in the previous volume of this Retrospect, p. 219. The principle on which the treatment is based is thus stated:

"To prevent the occurrence of suppuration, with all its attendant risks, was an object manifestly desirable, but till lately apparently unattainable, since it seemed hopeless to attempt to exclude the oxygen, which was universally regarded as the agent by which putrefaction was effected. But when it had been shown by the researches of Pasteur that the septic property of the atmosphere depended not on the oxygen, or any gaseous constituent, but on minute organisms suspended in it, which owed their energy to their vitality, it occurred to me that decomposition in the injured part might be avoided without excluding the air, by applying as a dressing some material capable of destroying the life of the floating particles.

"The material which I have employed is carbolic or phenic acid, a volatile organic compound, which appears to exercise a peculiar destructive influence upon low forms of life, and hence is the most powerful antiseptic with which we are at present acquainted."

As to the details of the treatment, Mr. Lister speaks as follows:

"In conducting the treatment, the first object must be the destruction of any septic germs which may have been introduced into the wound, either at the moment of the accident, or during the time which has since elapsed. This is done by introducing the acid of full strength into all accessible recesses of the wound by means of a piece of rag held in dressing forceps and dipped in the liquid. This I did not venture to do in the earlier cases; but experience has shown that the compound which carbolic acid forms with the blood, and also any portions of tissue killed by its caustic action, including even parts of the bone, are disposed of by absorption and organization, provided they are afterwards kept from decomposing. We are thus enabled to employ the antiseptic treatment efficiently at a period after the occurrence of the injury at which it would otherwise probably fail.

"The next object to be kept in view is to guard effectually against the

spreading of decomposition into the wound along the stream of blood and serum which oozes out during the first few days after the accident, when the acid originally applied has been washed out or dissipated by absorption and evaporation. This is done by employing a paste composed of common whiting (carbonate of lime), mixed with a solution of one part of carbolic acid in four parts of boiled linseed oil, so as to form a firm putty. This application contains the acid in too dilute a form to excoriate the skin, which it may be made to cover to any extent that may be thought desirable, while its substance serves as reservoir of the antiseptic material. So long as any discharge continues, the paste should be changed daily, and, in order to prevent the chance of mischief occurring during the process, a piece of rag dipped in the solution of carbolic acid in oil is put on next the skin, and maintained there permanently, care being taken to avoid raising it along with the putty. This rag is always kept in an antiseptic condition from contact with the paste above it, and destroys any germs that may fall upon it during the short time that should alone be allowed to pass in the changing of the dressing. The putty should be in a layer about a quarter of an inch thick, and may be advantageously applied rolled out between two pieces of thin calico, which maintain it in the form of a continuous sheet, which may be wrapped in a moment round the whole circumference of a limb if this be thought desirable, while the putty is prevented by the calico from sticking to the rag which is next the skin. This paste is to be covered with a layer of sheet-lead. When all discharge has ceased, the use of the paste is discontinued, but the original rag is left adhering to the skin till healing by scabbing is supposed to be complete.

"We cannot, however, always calculate on so perfect a result as this. More or less pus may appear after the lapse of the first week, and the larger the wound the more likely is this to happen. And here I would desire earnestly to enforce the necessity of persevering with the antiseptic application, in spite of the appearance of suppuration, so long as other symptoms are favorable. The surgeon is extremely apt to suppose that any suppuration is an indication that the antiseptic treatment has failed, and that poulticing or water dressing should be resorted to. But such a course would in many cases sacrifice a limb or a life."

Having thus reproduced Mr. Lister's directions for the carrying out of his method, we must refer the reader to the original for the theoretical reasoning upon which it is founded. As to its practical results, however, Mr. Lister makes one remark at the conclusion of his paper which is so important that we cannot but quote it:

"There is, however, one point more that I cannot but advert to, viz. the influence of this mode of treatment upon the general healthiness of an hospital. Previously to its introduction the two large wards in which most of my cases of accident and of operation are treated were among the unhealthiest in the whole surgical division of the Glasgow Royal Infirmary, in consequence, apparently, of those wards being unfavorably placed with reference to the supply of fresh air; and I have felt ashamed, when recording the results of my practice, to have so often to allude to hospital gangrene or pyæmia. It was interesting, though

melancholy, to observe that, whenever all or nearly all the beds contained cases with open sores, these grievous complications were pretty sure to show themselves; so that I came to welcome simple fractures, though in themselves of little interest either for myself or the students, because their presence diminished the proportion of open sores among the patients. But since the antiseptic treatment has been brought into full operation, and wounds and abscesses no longer poison the atmosphere with putrid exhalations, my wards, though in other respects under precisely the same circumstances as before, have completely changed their character; so that during the last nine months not a single instance of pyæmia, hospital gangrene, or erysipelas, has occurred in them.

"As there appears to be no doubt regarding the cause of this change, the importance of the fact can hardly be exaggerated."

In another contribution on the same subject ('Lancet,' Sept. 30, 1867) Mr. Lister expresses himself in the following terms:

"In suppurations of the vertebræ or of the joints the results of this system are such as I ventured with trembling hope to anticipate, patient perseverance being rewarded by a spontaneous cure in cases where excision, amputation, or death, must have resulted from any other known system of treatment. In short, the element of incurability has been eliminated from caries."

Mr. Lister has also given numerous cases in detail to illustrate the advantages which, in his practice, have attended this method of treatment. For these cases we must refer the reader to the 'Lancet' for March 16, 23, 30, 1867, and several other papers in that and other journals near the same date.

Mr. Syme has also published, in the 'Brit. Med. Journal' for June 4, 1868, a series of cases, consisting of an operation for parotid tumour, wound of the knee-joint, two compound fractures, psoas and mammary abscess, to show the benefit derived from this treatment.

Prof. Pirrie calls attention to the good effects of carbolic acid applied as a dressing to burns. He used a liniment of one part of the acid to six parts of oil, applied on two folds of lint, and covered over with tinfoil. In a case of scald, partly of the first and partly of the second degree, in which this treatment was adopted, the pain rapidly subsided, and the sore healed without any suppuration. The same method may also be used to blistered surfaces. ('Lancet,' Nov. 9, 1867.)

Mr. Tyrell, of the Mater Misericordiæ Hospital at Dublin, has published three cases in the 'Brit. Med. Journal,' Jan. 8, 1868, as examples of the success of this treatment, which he follows in dressing most wounds and granulating surfaces.

In the 'Lancet,' i, 1868, p. 586, Mr. Ryley, of New Zealand, refers to his experience of carbolic acid, applied on Lister's plan, in compound fracture (two cases), abscess (one case), and superficial burns, in which he has had good success.

On the other hand, in the 'Lancet,' Nov. 2, 1867, Sir J. Simpson speaks in terms of unmitigated condemnation of the practice, which he regards as by no means original, referring to a work by Dr. Lemaire,

published at Paris in 1863, on the various applications of carbolic or phenic acid ('De l'Acide Phénique,' &c.).

In the 'Transactions of the Clinical Soc.,' i, p. 134, Mr. Durham has put on record a case of comminuted fracture of the femur in a healthy lad æt. 16, extending into the knee-joint, where he laid open the parts, including the knee-joint, freely, on account of suppuration, mopped them freely out with carbolic acid, and treated them after Lister's method, with perfect success. At the same time, Mr. Durham says that the general results of his practice in the use of carbolic acid do not bear any comparison, in point of success, with those obtained in Scotland.

In the 'St. George's Hospital Reports,' iii, a paper will be found by Mr. Holmes and Mr. Holdernesse, showing the results in forty cases of in- and out-patients, with various injuries, operations, and abscesses, in which Mr. Lister's treatment was pursued. The results were mainly negative, since pyæmia, erysipelas, sloughing, and tetanus occurred in about the same proportion as under the ordinary methods of treatment. The authors, however, relate some striking cases of kindly union, and are, on the whole, favorably impressed with the method.

In the Clinical Society's 'Transactions,' i, p. 138, Mr. Campbell de Morgan calls attention to the favorable results of antiseptic treatment in general, with reference to the chloride-of-zinc lotion in particular.

In the 'Medical Times,' i, 1868, pp. 256, 282, Mr. W. Adams speaks of Mr. Lister's antiseptic treatment. He attributes the good effects obtained exclusively to closing the wound (which he denominates "the subcutaneous principle"), and wrapping over it a mild antiseptic ("the antiseptic principle"). The use of a strong caustic antiseptic, as in sponging out the wound with pure carbolic acid, is, in his view, deleterious; and he does not accept the views which Mr. Lister has adopted from Pasteur as to the dependence of unhealthy action on the presence of minute organic germs in the air. Mr. Adams thinks the best material for carrying out the antiseptic and subcutaneous principles is the "styptic colloid" introduced by Dr. Richardson, and described by him in the 'Medical Times,' April 13, 1867—a compound consisting of ether saturated with tannin, with which gun-cotton and tincture of benzoin are mixed.

He mentions also the success which has attended in his own and in others' practice from the subcutaneous treatment of wounds, combined, in appropriate cases, with the use of mild antiseptics of various kinds; and he points out the classes of cases in which each plan, or both plans combined, are to be recommended.

On the removal of tumours by electrolysis. (Dr. Althaus, 'Brit. Med. Journ.,' May 11, 18; Dec. 7, 1867. Dr. Maurice Collis, Dec. 7, 1867).—Dr. Althaus, in the first place, describes the two uses for which electricity may be used in surgery, namely, either as a caustic, or for the purpose of decomposing tissues which it is wished to remove. For the latter purpose he proposes a modification of Daniell's constant battery, the liquids in which the plates are immersed being intimately

mixed with sawdust, so that a dry pile is produced, which is quite as effective as the ordinary arrangement, and is portable. Its action on animal tissues is thus described:

"The effects of this battery on animal substances are always the same at the negative pole, whatever may be the nature of the conductor used, because the metals are not changed by hydrogen or free alkali. At the positive pole, on the other hand, the effects vary according to the chemical nature of the conductor. Thus, for instance, on immersing a gold needle connected with the negative pole, and a steel needle communicating with the positive pole, into the white of an egg, a peculiar substance is formed round the negative pole, which looks at first sight like a coagulum or clot, but is in reality no clot at all, but a sort of froth, which consists of the particles of albumen mechanically driven asunder by the nascent hydrogen, and chemically altered by the evolution of free alkali, the presence of which may be shown by its action on litmus and turmeric paper. At the same time an entirely different effect is produced at the positive pole, where the steel needle is oxidized; and, by the development of sulphuric acid and chlorine, sulphate and chloride of iron are formed, which impart a yellow-reddish colour to the albumen, with which they form an organic compound. If the current be applied in this manner, no coagulation is caused anywhere; but if the nature of the positive electrode be changed, by substituting a brass wire for the steel needle, immediate coagulation is produced round the positive pole, which is due to the action of sulphate of copper on albumen. By substituting a steel needle at the negative pole for the gold needle, the same peculiar substance is formed there which was produced round the gold needle. I may remark here that this is very similar to the foreign body which may by electrolysis be safely deposited in an aneurismal sac, and round which we may expect a slow and gradual deposition of lamellated fibrine to take place.

"The disintegrating effect of the negative pole on muscular fibres may be well shown by inserting the negative needle into a small piece of raw beef, where the froth which at once appears on the fibres denotes the chemical action of the current on the same. If it be allowed to pass through it for some time, entire destruction of the substance is brought about. Of course, in the living body, this disintegration would be much more rapid, because there the tissues are thoroughly soaked in a saline solution at a temperature of 98°."

Dr. Althaus next describes the forms of needles which he uses for electrical operations on the living body, and he then gives the particulars of his experience up to the present time. The following is the statement in the last of his papers referred to above:

"The entire number of tumours I have up to the present time treated by electrolysis amounts to 58, amongst which there were 47 non-malignant and 11 of the malignant kind.

"Eleven cases of nævus have been under my care. Of these, 7 were cured; 1 patient was only seen once, and not heard of again; 1 discontinued the treatment before any appreciable result was obtained; 2 are still under treatment, and so much improved as to give the best hopes of eventual complete success. In none of these 11 cases was there, at

any time during the progress of the treatment, any bad symptom whatsoever; and in most cases not a drop of blood was lost. In 1 case the growth was so extensive that both Mr. Paget and Sir William Fergusson, who were consulted previously to the patient coming under my care, refused to interfere with the tumour. In another case, where the nævus was seated on the lower eyelid, Mr. Dixon had been previously consulted, and advised to leave the growth alone on account of its position, although the nævus was a source of great annoyance for the patient. Neither an awkward position, nor extreme size of a nævus, can ever be an impediment to the electrolytic treatment, which I believe to be suitable for all cases of nævus, indiscriminately.

"Of bronchocele, I have had 8 cases under treatment. Of these, 2 were cured, 1 was improved, 5 are still under treatment and progressing favorably. In several of these cases Mr. Prescott Hewett, Mr. Paget, and Sir William Fergusson, had been previously consulted, and had pronounced any of the ordinary operations to be inadmissible. Most of these cases were of an enormous size, and on that account required a long continuance of the treatment; but I believe my experience justifies me in saying that any case of bronchocele, however large, may, in course of time, be cured by electrolysis.

"Of sebaceous tumours of the scalp and face I have treated 14 cases. Of these 13 were cured; the fourteenth patient was obliged to leave town before the end of the treatment, but would, from the change already caused in the tumour, have been cured by one or two more applications. In sebaceous tumours the treatment is short, as they never attain to any considerable size.

"Of that hypertrophy of the skin which Mr. Wilson calls *ecphyma molluscíforme*, I have treated 5 cases. Two of these were seated on the upper eyelid, 2 on the cheek, and 1 on the back of the neck. Four of these cases were cured; the fifth was not heard of again after two applications, but, from the change already caused in the tumour, I believe that it must have disappeared long ere this.*

"Of kelis, I have had one case under my care; but, as I saw the patient only once, I am unable to say whether any result has been obtained.

"Of lipoma, 3 cases have come under my treatment. One of these is nearly cured; the other two patients discontinued the treatment before any appreciable result was obtained. One of these latter patients, a highly nervous gentleman, complained of pain and swelling of the tumour after the application, and wrote to say that some matter was formed at one of the punctures. This is the only case where some limited suppuration seems to have taken place in consequence of the galvanic applications.

"I have cured a cyst of the lower lip, in a gentleman, aged 53, and a ganglion on the wrist of a lady, aged 30, by the same method.

"Of glandular tumours I have treated 3 cases, all of which were much improved, but none continued the treatment until the entire removal of the enlargement. Thus, of 47 cases of non-malignant tumours, 29 were cured, 10 improved, and in 7 cases no result was obtained, or the result unknown.

* This case is now known to have been successful.

"In malignant disease, of which I have treated 11 cases, the results of the process are, as might have been expected, far less favorable. Wherever the cancer is one of considerable size, and growing rapidly, the pain may be relieved, and the further growth of the tumour be considerably checked, by the electrolytic treatment; but I have not hitherto obtained a cure of such patients. In 2 cases of scirrhus of the breast, where the constitution was apparently not suffering, and where the tumour was only of the size, in one of a filbert, and in the other of a nutmeg, the swelling has entirely disappeared; although, of course, I am not prepared to say that a cure has been effected. For the healing of an open cancer, the treatment seems to answer very well; I must say, however, that in no case of malignant disease have I ever trusted to electrolysis alone, but have prescribed at the same time powerful remedies to be taken internally, for modifying the constitution of the patient, such as bromide of potassium, belladonna, and quinine. Perhaps in course of time a more continuous application of the electrolytic process may be discovered, by means of which we may be able to starve out even malignant tumours with more success than has hitherto been obtained.

"The only part of the electrolytic operation which is at all unpleasant to the patient is the introduction of the needles through the skin. I, therefore, always use the ether spray, unless the patient himself objects to it. To some patients the smarting of the ether is more unpleasant than the prick of the needles, but in the majority of cases the ether spray is preferred. The galvanism itself is almost, or even entirely painless, if judiciously applied. The length of the application should vary according to the nature of the case. For small tumours 2 or 3 minutes are frequently sufficient; for large ones 15 to 30 minutes are preferable. In the latter the best plan is to apply the current every day for some time; but I have also obtained satisfactory results where it was only done twice or three times a week."

Dr. Collis supports Dr. Althaus's views as to the uses of electricity in surgery, and he has further applied it to produce the wasting of tumours by the application of a mild continuous current of electricity through them. The following is Dr. Collis's account of his method and its results. The battery employed was the simple voltaic pile, composed of a dozen or more couples of zinc and copper, an inch and a half square, or of small cylinders, or plates of wood covered with felt and wrapped round with zinc and copper wire. These simple batteries were excited by salt and water or by sulphuric acid, in the proportion of 1 to 20 of water.

The mode of application was as follows. The tumour was covered with a plate of zinc, perforated zinc, silver foil, copper, or copper plated with silver. The positive pole was connected with this plate; the negative pole with a plate of copper, which was brought into contact with the skin of the back or other convenient part. The battery, tied up in gutta-percha paper, or oiled silk lay on a table, or was tied round the waist of the patient.

The results were as follows:

1. Complete removal of secondary cancerous deposit from a gland in the neck.

2. Rapid absorption of inflammatory deposit over and round an immense mass of strumous gland.

3. Slow removal of said gland.

4. Immediate check to the growth of a tumour composed of an aggregation of strumous glands.

5. Considerable cutaneous and subcutaneous inflammation in the same case, with softening and breaking up of the diseased glands.

6. Decided absorption of inflammatory effusions round primary scirrhus of mammary region.

7. Diminution and softening of a very firm fibrous growth attached to the periosteum.

All these results, except No. 3, were obtained in from 3 to 6 days, and all the cases had previously been submitted to a variety of treatment without benefit. Special results of a peculiar nature were observed as follows:

8. The zinc plate on the skin showed the usual tendency to decompose the skin and produce ulcerations in a few hours.

9. Perforated zinc, employed to obviate this, produced phlyctenæ and pustules in the interspaces not covered by it.

10. Silver, whether as foil or plated on copper, produced redness of the skin, but with less rapid tendency to ulceration.

11. Copper plates were comparatively slow to act on skin in connexion with the negative pole; but the copper connected with the positive pole on one occasion blistered the skin severely when a very strong battery was used.

Torsion and acupressure.—In the 'Lancet,' July 6, 1867, and 'Brit. Med. Jour.,' April 18, 1868, will be found short notes of lectures addressed to his class by Mr. Syme, on the subject of treatment of wounds with a view to primary union. Adopting entirely M. Pasteur's views, and the treatment by the application of carbolic acid which Mr. Lister has founded upon those views, Mr. Syme proceeds to say that, although he has used torsion of arteries in many cases ever since the time of M. Amussat (whom he regards as the introducer of this method of treatment), yet in all operations and injuries in which there was risk of blood and bloody fluid collecting in the cavity of the wound he has always hitherto preferred the ligature, in order to avoid the risks following on the decomposition of such fluid by the action of the air, since the ligatures act as drains along which the bloody fluid oozes out from the wound. Now, however, that those risks have been obviated by the introduction of the carbolic acid as an antiseptic, Mr. Syme believes that it is quite justifiable to trust to torsion alone, and to close the wound at once; and he mentions, in the more recent of the two lectures referred to, that in all the operations performed during the previous winter course no ligature had been applied except to the femoral artery; while, in all the amputations of arms, legs, and feet, the excisions of joints, the removal of tumours, and other operations, during the same period, there had not been a fatal result. Mr. Syme warmly denies

that torsion interferes with primary union, and gives some examples of that method of union in wounds so treated.

In the 'Brit. Med. Journal,' Aug. 3, 1867, and March 23, 1868, may be found two lectures by Dr. Humphry on the treatment of wounds. Dr. Humphry, in the first place, speaks of sutures. He says—"If the common suture be used, thread is quite as good, if not a better, material than wire. I have found that, if the parts be at all upon the stretch, the thread holds its ground longer, and causes less irritation and less ulceration of the skin, than the wire. I tested this by inserting thread and wire sutures alternately in the same wound; and the wires, in each instance, cut their way out sooner than the threads. The threads should be so inserted that the edges of the skin are brought into actual contact by them, without any intervening fat or other tissue; and they should not be tied tight—*i. e.* the portion of skin included in the knot should not be strangulated or even injuriously compressed. With this precaution they will excite little or no irritation, unless there be tension of the skin, in which case, as I have said, they will cause less irritation than wires."

With regard to pressure and to local applications to wounds, he expresses himself thus:—"It is very difficult to adjust pressure accurately enough on a large wound to prevent the oozing of blood; and, unless it is well applied, it is a sure cause of pain and inflammation. Slight uniform pressure might be serviceable; the well-doing of superficial wounds, which are simply bound up and sealed by their blood, indicates that it would; but in larger wounds I have found that pressure applied in various ways, and as carefully as I could, did, on the whole, more harm than good. I have, therefore, for many years, been in the habit of leaving the wounds after operations with their edges approximated by sutures, quite uncovered and dry. The part is thus cool, and free from any external source of irritation. To the advantage of enabling us to see the state of the wound and of the skin around, this plan adds the very great comfort to the patient that there are no applications to be removed, no dressing to be done. That grave addition to the distress following an operation is spared. Warm-water dressing or a poultice, after a few days, may be desirable. We rarely resort to any other means in this hospital, and have had good reason to be satisfied with our non-interference. I am glad to learn that the same plan is being tried in some other hospitals, and with good result."

In the remainder of the first lecture Dr. Humphry speaks of the necessity for securing all vessels, believing that secondary hæmorrhage generally proceeds from the fault of the surgeon in neglecting to secure some vessels; and then discusses Sir J. Simpson's proposal of acupressure, giving particulars of some cases in which he had used it with success. He says, however, in his second lecture—"The presence of the needles in a wound, even for a short time, is objectionable; and their removal, just when a patient is beginning to recover from the effects of an operation, and is peculiarly sensitive to any impressions and apprehensive and distrustful of our intentions, I found to be a source of annoyance; and I was anxious to find some effectual means of arresting hæmorrhage without the necessity of leaving any foreign body

in the wound. After thinking, therefore, a good deal on the subject, and reflecting over various modes in which the end of the vessel could be temporarily sealed, I tried the plan of torsion, which has of late been used in Edinburgh and elsewhere, and have employed it now in a great many cases, including amputation in the thigh, in the leg, and many others. Indeed, for several months I have used no other means but torsion for arresting hæmorrhage, and it has answered perfectly in all the cases. There has, I think, been less pain after the operations than was experienced when we used the ligature, and the wounds have, on the whole, done better and healed more quickly."

The plan which Dr. Humphry adopts is to seize the vessel with a pair of strong narrow-bladed hinge-forceps, used in operations for necrosis, and twist the end off; and he makes the following practical observations on some of the details of the method:—"Torsion has certainly in my hands proved somewhat more difficult than the ligature, requiring more care, more patience, and more perseverance. It is necessary to include the vessel itself in the forceps; for it is useless to twist the surrounding tissues; and it is not always easy, when blood is flowing, to make sure of the exact point from which it flows. Often, therefore, when I have been twisting, I found that my efforts were of no avail, because I had not seized the exact orifice of the vessel. Even when the vessel is seized, the inner coat is liable to slip from between the blades of the forceps, the outer coat only being retained and subjected to the torsion; and this is not to be relied on. When, however, I have been sure of having seized an artery and properly twisted it, I have not known any further bleeding to take place from it; and if it be carefully done, torsion is, I think, a valuable means of securing small and medium-sized arteries, such as the tibials, facials, &c., and, by reducing the number of ligature-threads, it will be found to promote early healing of wounds. Whether it will prove to deserve our confidence in the case of the larger arteries, I am not so sure; but I should say that the doubt is founded rather upon what I have found in experimenting upon the dead subject than on what I have observed in the living; and it may be that better appliances and more experience may justify a greater reliance upon its efficiency."

In the 51st vol. of the 'Med.-Chir. Trans.,' p. 199, Mr. Bryant discusses the subject of torsion. He first discusses the history of the proposal, omitting, however, any reference to the works of Porta, by whom (as noticed by Mr. Gamgee, in a letter to one of the journals) torsion was both proposed and practised even in amputation of the thigh; then compares it with acupressure, noticing the insecurity which must always attend on the latter method, inasmuch as it does not effect any change in the coats of the vessel, but depends for its hæmostatic effect solely on the clot formed inside the artery. He then separates torsion into two kinds—*free*, where the end of the artery is merely seized by a pair of clasp forceps and twisted freely; and *limited*, where it is also seized transversely about $\frac{3}{4}$ths of an inch from its divided end, so that only so much of the vessel is twisted. Numerous experiments on animals are then related and illustrated by coloured drawings; and one drawing is given of the brachial artery in the human subject 35

hours after torsion. Mr Bryant adds the conclusions to which his experience has conducted him, some of which we may quote—as follows:

"In torsion the *twisted* cellular coat forms, with the retracted and incurved middle coat, the direct mechanical obstacle to the flow of arterial blood, in the same way as the *compressed* cellular coat does in the ligature; but in torsion the twisted cellular coat and incurved middle coat become subsequently a permanent means of occluding the end of the artery, whilst the ligature becomes subsequently a source of irritation, and too often a means of undoing what has been done by nature's own hæmostatic processes.

"In torsion the twist in the cellular coat of an artery; the division and subsequent retractation, incurvation, and adhesion of the middle coat; and the coagulation of the blood in the vessel down to the first branch, are the three points upon which its temporary, as well as permanent, safety depends; whilst the permanent safety of acupressure rests upon the last point alone, and its temporary effects upon the pressure produced by the needle.

"There is every reason to believe that, when torsion has been successful on its first application, the fear of subsequent hæmorrhage is altogether groundless.

"Upon physiological grounds torsion has decided advantages over the ligature and the acupressure needle."

Further experience of acupressure.—In pursuance of the review which we gave in the last Retrospect of Sir James Simpson's proposal for securing vessels by acupressure, we have thrown together the following records of surgical experience on this subject since that publication. In the first place, we shall arrange the writings of those surgeons which have come under our notice whose experience of this method has been satisfactory, and who have therefore adopted it as their ordinary resource in the treatment of hæmorrhage. Profs. Pirrie and Keith, of Aberdeen, have published a joint vol. (Aberd., 1867, pp. 190), in which the former relates 32 cases, of which he gives the following summary:—"They comprehend 7 cases of amputation of thigh, 4 of amputation of leg, 1 of amputation of arm, 8 of excision of mamma, 3 of excision of elbow-joint, 2 of removal of testicle, 1 of wound of the upper part of forearm, 1 of wound of hand, 1 of excision of an erectile tumour, 1 of excision of the upper part of fibula, 1 of hæmorrhage from sloughing of the ball of the thumb, 1 of a wound of the radial artery, and 1 of removal of an epithelioma and entire restoration of the lower lip. In every case, both in hospital and private practice, in which I have employed acupressure, its use has been most satisfactory."

Prof. Pirrie enumerates after Mr. Paget the various ways in which union of wounds can occur, and then proceeds to relate the histories of all his cases. We cannot, of course, give even an abstract of these notes, but some of the cases are of such practical interest in the details of the method that we may be allowed to quote a few lines. In case 4, an amputation of the thigh in a woman æt. 66, 5 arteries were secured by long pins and wire loops:—"When the flaps were brought together, the heads of the pins and ends of the loops projected a little beyond

the lips of the wound, and after the patient was put to bed the pulsation of the femoral artery communicated an impulse to the pin by which it was secured, so that for two days the pulse could be counted by looking at the glass head of the pin. I have usually removed the needles in 48 hours, but in this case, while pulsation continued, I did not think it advisable to remove the pins till the third day, when the pulsation had ceased; and then, 72 hours after the operation, I removed the whole of the pins and loops without a single drop of blood following."

In the next case the patient died thirty-six hours after amputation of the thigh;—"On removing the needle and loop, and on laying open the vessels, it was found that the artery and vein were both free from any trace of inflammation, and that their coats were perfectly entire and uninjured where they had been embraced by the needle and loop. The obliterating coagulum in the artery was composed of 3 pieces, adherent to each other, and very slightly so to the interior of the artery."

In case 14, an amputation of the arm high up in a child, æt. 7, "3 arteries were acupressed by needles and loops. One of the vessels was the axillary artery, and this was the first time it ever was acupressed in this hospital. The passing of the needle below and the loop above the axillary artery was greatly facilitated by taking hold of the mouth of the vessel with the artery forceps, and drawing it out very slightly, a proceeding Dr. Keith, Dr. Fiddes, and myself have since sometimes found useful for making it easy to acupress an artery in a confined corner of a wound. The needles and loops were all removed in fifteen hours. Those belonging to the axillary and another artery were brought away as usual without the slightest difficulty, but there was a little resistance in the drawing out of the third needle, owing, as was found on its removal, to the wire with which it was threaded having kinked. About 6 or 8 drops of blood followed the removal of the third needle, but the manner these drops came away satisfied me that they came from the track of the needle, whose head, owing to the kinking of the wire, caused slight laceration while being withdrawn, and not from the artery which the needle was used in securing. I think this is the only instance I have ever seen in which a single drop of blood appeared on the removal of needles, pins, or loops used in acupressure."

Case 21 is one of great surgical interest, a long and deep wound in the palm of the hand, dividing, no doubt, the superficial and perhaps also the deep palmar arch. It was parallel and a little internal to the metacarpal bone of the little finger, and extended deeply in front of the metacarpal bones for more than two inches across the hand, about as far as the interval between the fore and middle fingers. Pressure on the ulnar artery commanded the hæmorrhage for a few seconds only; pressure on both arteries stopped it altogether. The bleeding was entirely stopped by passing acupressure pins under both the radial and ulnar arteries a little above the wrist, and putting the hand in the extended position on a splint. The pins were removed 24 hours after their insertion, and the wound was healed by primary union at that time.

In Case 24 a man, æt. 38, much exhausted by repeated hæmorrhage from a cancerous tumour, had amputation performed below the knee.

"Twenty-four hours after operation I relieved the anterior tibial artery from acupressure, and it instantly bled as energetically as if it had been that moment cut across. Acupressure pins and loops were in the ward, the house-surgeon and some of the surgical pupils of the hospital were with me at the time, and I immediately got the femoral artery compressed, opened the wound, and acupressed the artery again by the fourth method. The blood lost did not exceed a dessert-spoonful, and the whole proceeding did not occupy more than three or four minutes. This is the only instance in which I have ever seen any hæmorrhage from an artery on its being freed from acupressure, and I attributed its occurrence in this case to the extreme exhaustion of the patient being unfavorable for adhesion."

The man died of exhaustion twenty days after operation, and thus another opportunity occurred of seeing the state of the vessels after acupressure. They were all small and empty, and the coats contracted and thickened, especially in the terminal three quarters of an inch or so of each. The anterior tibial was larger than the posterior, even before the latter had given off the peroneal. They were all detached from their sheaths with unusual facility, and the adhesions of the cut extremities to the surrounding tissues were very slight. The posterior tibial and peroneal were only closed by a slight exudation of lymph, which had united together the divided extremities in each case; and in the posterior tibial this lymph was so soft as to give way upon very gentle pressure. The anterior tibial was closed by a well-formed, firm, doubly conical plug of decolorised fibrin about three eighths of an inch long, which was adherent to the walls of the vessel throughout its distal third. The veins accompanying the arteries were natural in appearance, but the blood which they contained appeared to be semi-disorganized.

Prof. Pirrie concludes from his experience that, in ordinary cases, acupressure is superior to deligation, for the following reasons:—1. It is the easiest and the quickest method yet devised for arresting bleeding. 2. It shortens the time necessary for arresting hæmorrhage, involves less handling of the parts, and therefore diminishes the risk of suppuration or the higher grades of inflammation. 3. It does not offer any obstacle, as the ligature does, to the occurrence of primary union. On this head Prof. Pirrie says, "I have seen, in my own experience and in that of my colleagues, many examples of wounds after capital operations, where acupressure was used, where healing was effected in some by immediate union, and in others by primary adhesion, without a single drop of pus." This is, of course, impossible with the ligature. 4. He believes that pyæmia will be found less common after acupressure; up to the date of publication not a single case of pyæmia had taken place after acupressure in the Aberdeen Hospital. 5. The briefer sojourn of the foreign body in the wound, its non-absorbent properties, the absence of division or strangulation of the coats of the vessels; and, 6, the comfort to the patient of knowing that all foreign matters are withdrawn from the wound, and no more interference with it will be necessary, are also dwelt upon as points of supe-

riority over the ligature. When, however, union by granulation or by secondary adhesion is desired, tying the arteries is to be preferred.

Dr. Keith is entirely in accord with Prof. Pirrie as to the value of acupressure. Out of about 40 cases in which he has used it he contributes 12 to this volume—3 of amputation of the thigh, 3 of the arm (1 at the shoulder-joint), 1 of the forearm, 3 of the leg, 1 of excision of tumour, 1 of deep perineal wound. In one of the cases of amputation of the leg (primary, after injury) death occurred on the sixth day, from phlebitis of the injured limb. No pyæmic deposits are mentioned. We again give the notes of the dissection of the stump:

"The flaps were easily separated; no coagulum was in the wound; one red stain, the size of a fourpenny piece, tinged the flesh at the end of the posterior tibial artery, and that seemed all the effusion of blood that had followed the closing up of the wound. The mouths of the anterior tibial, the peroneal, and the posterior tibial arteries lay open to view. Their ends were abrupt, solid-looking, not much retracted, nor in any marked degree contracted, but filled up by organized fibrine or lymph, as solid to the look, and almost as so much to the feel, as the coats of the vessel. The popliteal artery was dissected out along with the above-named vessels, and showed on trial as perfect occlusion at the cut ends as was ever witnessed. On slitting these vessels open from above downwards, the following observations were made:—The peroneal artery was firmly plugged at its cut end for one fourth of an inch by a colourless fibrous-like tissue indissolubly united to the lining arterial coat. No conical continuation of the plug extended up that vessel. The anterior tibial was in like manner completely occluded. The vessel, when slit up, revealed a short conical continuation of fibrine pointing upwards, its further progress having, no doubt, been hindered by two small branches in close proximity passing off from the main vessel just above the tip of the clot. The posterior tibial was very effectually closed by a well-plugged mouth, and inside by a conical extension of the plug upwards to fully half an inch, the tissue composing it slightly tinged with blood, the plug and the cone being one and the same mass.

"The vasa vasoram had evidently maintained the vitality of the arterial coats, so as, at once, to commence the vital and healing process of exudation of lymph at the cut ends all the more readily that the cellular attachments around the vessels had never been disturbed."

It is also mentioned that Dr. Fiddes has employed acupressure at the Aberdeen Hospital with equally good results.

In the 'Guy's Hospital Reports,' xiii, p. 112, Mr. Cooper Forster relates 31 cases operated on by himself or his colleagues, in which acupressure had been used. The results of these cases were very different from those attained by Messrs. Pirrie and Keith, which Mr. Forster regards as being exceptional. Mr. Forster points out the advantages and disadvantages of the plan, to which he announces himself, on the whole, as an adherent, having determined "never again to use a ligature in any case where the edges of a wound are brought into apposition with a view to their adhesion."

The condition of the arteries after acupressure is shown by two cases

related in the 'Transactions of the Clinical Society,' i, pp. 118—121, by Mr. H. Lee and Mr. J. W. West. The arteries were found firmly sealed with coagulum at the divided end. In Mr. Lee's case death took place five days after the operation; the femoral artery had been secured for three days. In Mr. West's case death took place fifty-six hours after amputation, the needle below the femoral not having been removed. In the former case the presence of the needle had produced slight ulceration, not perforating the vessel. Neither Mr. Lee nor Mr. West had ever seen primary union after acupressure.

On the other hand, the experience of some surgeons has not been so satisfactory. In relating two cases of amputation under Mr. Willett's care at St. Bartholomew's Hospital, in the 'Lancet,' May 25, 1867, the reporter says:

"Attention is being directed just now at several of the metropolitan hospitals to the use of acupressure as a means of commanding vessels after operation, and the method seems likely to meet with such a trial as will determine whether its advantages are such as to bring about its more general employment. Without attempting as yet to pronounce any opinion on this point, we have already seen enough to convince us that the rapid and efficient application of the method necessitates some considerable acquired or natural dexterity—more, undoubtedly, than the employment of a ligature."

The first of the cases was an amputation of the thigh, in a patient æt. 35, where great distension of the flaps (from exudation of blood) followed the operation, and one of the pins (13 of which were used) got buried in the stump, and could not be found. The search for this caused some bleeding. At the date of the report, five weeks after the amputation, the patient was sufficiently recovered to leave his bed. The other case was an amputation of the leg in a man of feeble power, for disorganization of the ankle-joint, in consequence of a wound. A portion of the anterior flap sloughed, and there was extensive suppuration.

In alluding to the first case, Mr. Willett said the drawback to its success was caused by the circumstance that two of the pins became completely buried in the wound, owing to the great distension of the stump which followed the operation, one remaining lost up to the present time. Hæmorrhage following so closely upon the search made for the missing pins was, without much doubt, induced by that step; and although there existed no cause for alarm, still the patient's convalescence would be retarded, and the wound prevented from healing soundly, so long as the pin continued in its present situation.

The occurrence of sloughing of a portion of the flap in the last case was no more than might have been expected, for the vitality of the parts had been much impaired by an attack of diffuse inflammation with sloughing of subcutaneous tissue before the operation.

Excepting the incidents stated, these patients progressed as favorably as would have been anticipated had ligatures been used instead of pins, whilst no advantage had resulted from the proceeding adopted.

In the 'Lancet' for May 18, 1867, Mr. Callender speaks as follows:

"Acupressure was practised on the 13th of April last by Sir J. Simp-

son, on a patient whose breast had been removed by M. Richet, at the Hôtel Dieu.* Eight needles were employed, and there was no hæmorrhage after their removal, but the edges became erysipelatous, rigors followed, and the patient died on April 18.

"On April 17 I amputated a scirrhous breast. The patient, æt. 66, was not a favorable subject for an operation, but the pain in the tumour rendered removal of the growth desirable. Bleeding was stopped by means of four needles, which were removed thirty-six hours after the operation. But the wound presented an erysipelatous blush, with some dusky discoloration, and, beginning rapidly to distend with products of decomposition, had to be speedily opened. Its entire surface was in a state of gangrene, and the woman, sinking with symptoms of blood-poisoning, died on April 23. In this case the wound, which was of some size, had been closed, contrary to my usual practice, in the hope that speedy union might be obtained, owing to the presumed absence, through the use of the needles, of all local irritation. Failing in this, the patient was poisoned from the rapid disorganization which ensued, and the absorption of the decomposing materials.

"There cannot be any doubt, and the fact has long been admitted, as to the efficiency of a compress, such as the acupressure needle, to arrest bleeding; but the practical question which remains to be dealt with is the superiority of this plan of treatment over that of the ligature in favouring early union of wounds, and it is with reference to this point that the two cases referred to are of some interest, and may be of service in the present early stage of inquiry into the subject, so far as showing that in the repair of wounds acupressure has its unfavorable results. Unless the experience of more numerous observations teaches us that the after-progress of surgical operations is helped by the use of the needles, they must be regarded as but a clumsy substitute for the ordinary ligature. This is the compass of the question.

"The influence of ligatures to hurt the healing of wounds has been of late very unfairly stated. It seems to me, for example, at least doubtful pathology, on the part of the more earnest advocates of acupressure, to compare the parts surrounded by ligatures to so many sloughs. No surgeon can have had the misfortune to open a stump on account of secondary hæmorrhage but must have had an opportunity for observing that no such sloughs exist, but, on the contrary, that the tissues tied off by the ligatures at once adhere to and receive nourishment from the parts adjacent; thus they live, and do not die."

In a clinical lecture on the treatment of wounds, reported in the 'Brit. Med. Journal' for Dec. 21, 1867, Mr. S. Gamgee discusses the question of the suppression of hæmorrhage by torsion and by acupressure, and avows his preference for ligatures in the following terms:

"My reasons for adhering to the ligature are the same as those which actuated Sir James Simpson in preferring the passive iron of Schönbein to silver as a material for sutures. 'I have used,' writes the Edinburgh Professor, 'iron suture-threads in a great number of cases in the operation for vesico-vaginal fistula, and with such almost invariable success

* 'Gazette des Hôpitaux,' 23 Avril, 1867.

in the way of effecting complete primary union, that I have no desire to change.'

"While adhering, for similar reasons, to the ligature for the closure of wounded arteries, and not wishing to retract the statement I have made relative to the causes of surgical mortality, I freely admit that the ligature is an evil, and partly accountable for the deaths in unhealthy hospitals, by giving rise to, or acting as a concurrent cause of, discharges which are the active incidental instruments in pyæmia and allied diseases. Any agency which shall prove to be as powerful and safe as the ligature in arresting hæmorrhage, without acting like the ligature as an incentive to suppuration, will unquestionably be a great surgical gain. The claims of torsion and acupressure to that distinction have been urged with the most passionate enthusiasm, the most ingenious argument, and the most abundant eloquence; but at present, I think, the verdict on these claims must be 'not proven.'"

In the 'Brit. Med. Journal,' Oct. 12, 1867, Mr. Nunneley, of Leeds, refers to the failure which he believes to have hitherto attended the practice of acupressure, notwithstanding the exceptional success of Dr. Pirrie and Keith. Agreeing, however, in the importance of securing the vessels, if possible, without any foreign body being left in the wound, he suggests the use of fine forceps, constructed on the principle of the "bull-dog forceps," of various lengths, in order to correspond to the depth of the vessel. The bowed end of the forceps is left projecting from the wound, and the forceps can be loosened by pressure on the bow when it is necessary to withdraw them. If more power be required than can be obtained by the bow, they can be closed by a clip fitting on the projecting end. The following is Mr. Nunneley's account of his experience of this plan:

"From small arteries I have removed the forceps in from twelve to twenty-four hours, but, in the larger, twenty-four to forty-eight hours should be allowed to elapse before they are taken away, by which time, I apprehend, the largest artery may be regarded as effectually sealed, though, if thought requisite, I see no reason why they may not be left *in situ* for a longer period. Hitherto all the cases in which the forceps have been employed have done remarkably well, but a longer time and more experience will be required before we can dogmatise upon how much is due to the employment of the forceps, and how much to other circumstances."

In the same journal for Nov. 16, 1867, Dr. Wolfe, of Aberdeen, expresses his concurrence with Mr. Nunneley's views as to the failure of acupressure as at present used, and figures an instrument which he has devised for the same purpose—a kind of canula-forceps. The vessel is seized with the points of the forceps, to which a handle passing through a tube is fixed. The handle being drawn back, the points of the forceps are clamped by the tube. Dr. Wolfe does not say whether he has tried this invention.

In the 'British Medical Journal' for Feb. 1 and March 14, 1868, will be found proposals from Dr. Sarazin, of Strasburg, Dr. Taylor, of Edinburgh, and Dr. Smith, of Baltimore, for substituting various forms

of temporary compression by forceps or loops of wire for the ligature or acupressure.

Local anæsthesia.—With reference to the production of anæsthesia by the ether spray a case under Mr. Lawson's care is reported in the 'Lancet,' May 25, 1867, in which an abscess existed behind the mamma. As the pus was very deep (under the pectoral muscle, indeed) the refrigerator was used, paraffin ether being employed. Congelation was rapidly produced, and kept up for a few minutes. The result has been that a portion of skin, about an inch by three quarters of an inch, over the upper part of the breast, has sloughed, and its healing will necessarily be attended by an unseemly scar. The case is certainly exceptional; but the circumstance is worth remembering when exposed parts of the body are to be operated upon.

The following selections refer more especially to operative surgery.

Modification of the operation of Celsus for lithotomy. By Sir W. Fergusson.—In the 'Lancet,' July 13, 1867, p. 42, may be found a description of a method of lithotomy employed by Sir W. Fergusson at King's College Hospital, and which is thus described:

"The ordinary curved staff was introduced into the bladder, and held as if for lateral lithotomy. The operator then plunged his knife into the right side of the patient's perinæum, nearly an inch below the anus, and about midway between that aperture and the right ischial tuberosity. The knife then—its cutting edge being upwards—was carried over the anus and down again on the other side to a position corresponding to that where it commenced. In this way a lunated cut was made, the concavity of which was directed vertically downwards. The forefinger and middle finger of the left hand, with their dorsal surface looking up, were then directed horizontally forwards, so as at once to push back the rectum out of harm's way, and to embrace between them the bend of the staff, furnishing thus an effective guide to its groove, which the knife then entered, and completed the operation exactly as if for lateral lithotomy. The difference, indeed, between the process here employed and the usual one lay in the outer cut, which, instead of being directed downwards and outwards from the raphé of the perinæum, formed a crescent which included the anus. The position of the staff, the deep incision, and the use of the forceps, were the same as those ordinarily employed."

The advantages of this method of operating are thus reported by the 'Lancet,' in the words of the operator:

"The especial advantage of the lunated incision was that the cut was formed in exactly the widest part of the perinæum, and it was, of course, of great moment to secure the widest space. It was an imitation of the direction and situation of Nature's outlet in the other sex—the vagina—as the median operation might be considered an imitation of the direction of the vulva. Sir William thought that the combination of a lunated cut and the use of the staff should be fairly tested. He pointed out the advantage gained by being able to introduce two fingers between the rectum and the staff, pushing back the rectum out

of reach of the knife, whilst at the same time this very act opened the wound. In median lithotomy pressure backwards of the rectum tends to close the wound. No doubt the rectum was not now so often wounded as it was thirty or forty years ago; but it was still very frequently cut, more often, indeed, he thought, than was generally understood."

A more full report of Sir W. Fergusson's lecture on this subject may be found in vol. i of the 'Lancet,' 1868, p. 1, with reference to four cases thus operated on.

Lee on medio-lateral lithotomy.—In the 'St. George's Hospital Reports,' iii, p. 27, is the account by Mr. H. Lee of an operation somewhat similar in principle to that of Sir W. Fergusson. An incision is made in the median line of the perinæum to within two or three lines of the anus, and from its posterior extremity the incision is prolonged in a circular form round the anus. The rectum is then pushed back and separated from the parts in front by a touch or two of the knife. Then the left forefinger is passed into the rectum to feel for the groove of the staff, which is opened in the membranous portion of the urethra. A probe-pointed knife is next passed into the groove of the staff and along it into the bladder. "The blade of the knife is then directed towards the patient's left side, and somewhat backwards, and as it is withdrawn the heel of the knife passes in the direction of the original incision through the skin—the point of the knife remains very nearly in the median line—a free external incision is thus produced, involving no important parts, with a small opening into the bladder." By this operation, which Mr. Lee describes as a very easy one, and of which he relates 3 successful cases, he believes all the risks incidental to the ordinary lateral operation are avoided.

Removal of cervical tumours.—In the 'Dublin Quart. Journ.,' Nov. 1867, Mr. Spence publishes a case in which he successfully removed a large and deeply seated cervical tumour. Mr. Spence refers to a similar case, previously published in the same journal, Nov. 1863, in a woman named Jepson. In the present instance the patient was a boy, æt. 16. On examination, the tumour, which was somewhat irregular in form, nodulated on the surface, and of a firm consistence, was found to occupy the whole of the left side of the neck. Commencing at a point close under the angle of the jaw, it passed beneath the sterno-mastoid muscle, and then projected towards the surface, extending back to and elevating the anterior margin of the trapezius, and occupying the whole of the supra-scapular and subclavian regions of the neck, where it lay below the posterior belly of the omo-hyoid muscle. On the mesial side of the sterno-mastoid, the tumour projected inwards, pressing the larynx and trachea to the right side; it bulged upwards to a level with the os hyoides, and below, it dipped beneath the muscles in front of the trachea, and descended into the supra-sternal fossa. The growth seemed movable, and its margins were pretty well defined.

"On the 12th June I performed the operation for the removal of the tumour in the following manner:—I first made an incision along the course of the sterno-mastoid, from the angle of the jaw to beyond the sterno-clavicular articulation. Then at its lower termination I made a small transverse incision, about an inch and a half in length, so as to enable me to expose more fully the part where the tumour passed into the sternal fossa. Lastly, I carried a third incision, four inches long, from the middle of the first incision backwards to the anterior margin of the trapezius. I then dissected the skin and platysma, so as to expose the anterior portion of the tumour as far inwards as the tracheal margin, which I cleared from the fascial covering, and elevated. Next passing my finger beneath the fascia and the fibres of the omo-hyoid muscle, which were stretched over the growth at the lower part of the neck, I divided them, and had the satisfaction to find that the sub-sternal portion was defined and unattached, and could be readily turned out. I now proceeded to clear the remainder of the tumour by dividing the sterno-mastoid transversely and dissecting it, and the other coverings off from the surface in two flaps, as marked out by the incisions. In doing this some small superficial vessels were tied. On fully exposing the tumour a large vein was seen on its surface at the upper part. This vein, though distended above, was obliterated where it lay over the lower part of the growth. The distended part of the vein I included in two ligatures and divided it between them. The whole mass being now fully exposed, I proceeded to dissect it out from before backwards, feeling with my left fore-finger for the vessels, so as to protect them from risk of injury. On clearing and raising outwards the anterior portion of the growth from its deep connexions, the carotid artery and pneumogastric nerve were seen bare, as if dissected from their sheath, but the internal jugular vein could not be seen, and the pneumogastric lay somewhat in front of the carotid at its lower part. As I could neither see nor feel anything of the internal jugular, I next dissected the tumour from its posterior aspect, and then from the sub-clavian space, cutting with the edge of knife close towards the deep surface of the tumour, so as to avoid the phrenic and sympathetic nerves and the thoracic duct in the deep dissection at the inferior region of the neck. The patient did quite well. The tumour had the usual structure of an adenoid growth.

"In my memoir of Mrs. Jepson's case I adverted to the want of success which has hitherto attended operations for the removal of such deep-seated cervical tumours, as I could find no record at that time of any case in which a large tumour situated under the sterno-mastoid had been completely removed, with ultimate success; none, indeed, where complete removal had been effected. As it seemed to me that this want of success had led some surgeons to express strong opinions against operations for the removal of deep-seated cervical growths, I stated my opinion that the certainty of complete and safe removal of such tumours depended on the selection of proper cases for operation, by careful attention to the history of the case, and to the diagnosis of the character of the growth; for if the tumour was of slow growth and simple character, we could calculate on its comparative definition and

circumscription. Unfortunately, the proportion of malignant cervical growths is much greater than of those suitable for interference."

In neither of Mr. Spence's cases was the division of the sterno-mastoid attended by any malposition, or even by any interference with the movements of the head; nor was the section of the cervical portion of the spinal accessory nerve followed by any appreciable bad effect.

In the 'New York Medical Record' Dr. W. Warren Greene has published a case somewhat similar to the above. The patient, an adult male, had suffered for three years from the growth of a tumour, which had then attained the size of a croquet ball, on the left size of the neck, below the sterno-mastoid muscle, and projecting anterior to it. It was apparently quite movable. The operation for its removal was very similar to that in Mr. Spence's case, with the important exceptions that the sterno-mastoid muscle was not divided, and that the internal jugular vein was ruptured in clearing it from the tumour. It was tied, and about two and a half inches of its length removed. The patient did well.

On extirpation of the parotid gland for cancer.—In the 'Deutsche Klinik,' 1867, pp. 222, 228, 236, 248, Prof. Otto Weber states three cases in which he extirpated, as he believes, the entire parotid gland in cancer of that organ; and he appends some observations on the practicability and advisability of the operation. He differs equally with Allan Burns and Hyrtl, who teach that it is anatomically impossible to remove the whole gland, and with Busch, who teaches that extensive degenerations of the parotid are best left alone. He believes, on the contrary, that if the operation be properly performed the bleeding is more easily commanded than in many operations in the neck; and although the facial nerve must be divided and paralysis of that side of the face ensue, this is, in his opinion, only a trifling drawback if, as he believes, cancer may be extirpated, and a complete cure obtained. He thinks there need be little primary bleeding, if the vessels are secured as they are divided or exposed with two ligatures, one on either side; and that there will be no risk of secondary hæmorrhage. In the operation he directs that the parotid should be laid bare by an incision parallel to the ascending ramus of the lower jaw, to be crossed, if necessary, by another incision. The external carotid may be tied and divided as it passes into the gland at an early period of the operation, if it can be seen; but he does not consider this necessary, nor will the ligature of this artery stop the hæmorrhage from its branches. Ligature of the common carotid he dissuades as useless and dangerous. The proper fascia of the parotid is not to be divided if the whole gland is to be extirpated, nor should sharp hooks be inserted into it, since they easily tear this capsule. "In exposing the parotid we come first to the temporal artery below the zygoma, the anterior auricular in front of the meatus, and the transverse facial close beneath the articular condyle. It is better to expose all these vessels freely enough to be able to pass a double ligature around them with an aneurism needle before dividing them. At the under and posterior part the sterno-cleido-mastoid muscle comes into the way. If this is adherent, a part may be

removed with the tumour. . . . Posterior to the parotid in cancerous tumours the occipital and posterior auricular artery and the auricularis magnus nerve usually require division—the latter may sometimes be spared. Having now got the tumour free on all sides, the operator seeks for the external carotid artery. In cancer I always advise to remove the gland as completely as possible. Hence it is necessary to divide the external carotid and the temporo-maxillary vein. These also are to be cut between two ligatures; the parotid is then to be freed and lifted from its bed with the finger, in doing which some force is occasionally necessary, but too much force should not be used, otherwise the joint or the carotid, if it has not yet been divided, may be torn into, in consequence of the closeness of the cellular connections. Before the parotid can be completely severed from the styloid process and the pharyngeal muscles, the internal maxillary and ascending pharyngeal arteries have to be divided. They will bleed even if the external carotid is secured, and therefore must be ligatured. The remains of the gland are then to be dissected with knife and scissors clean off the fascia covering the internal carotid artery and internal jugular vein. It is occasionally necessary to follow the tumour to the inside of the ramus of the jaw, as it spreads to the submaxillary gland, and in some unfavorable cases the latter is also affected. Here, also, the extraction of the gland with the finger is serviceable, and in such cases the facial and lingual arteries must also be tied. From 12 to 16 ligatures are generally necessary, but the free use of the ligature spares blood and enables the operator to have a good view of the parts."

Three cases are given; in the first, the whole parotid having been extirpated, great deformity resulted from the drawing of the features. This was temporarily relieved by division of muscles on the other side. It is noticed that "trophic" inflammation of the eye followed on the division of the nerve, as it does on that of the trifacial, attributed to the dropping of the lower lid. The operation was performed in February. In October there was the commencement of return of the disease, when the account breaks off.

In the second case the tumour was very extensive, and in dissecting it out the pneumogastric nerve was exposed, but not injured. The joint was opened to a slight extent, the ninth nerve exposed, and the whole of the posterior edge of the jaw. The operation lasted one hour and a half. The patient was extremely weak and emaciated before the operation. He recovered, however, and derived much relief from it; but some swelling was noticed during the healing of the wound in the opposite parotid, and he died (not under Prof. Weber's observation) four months after the operation.

In the third case the tumour had been brought to ulceration by the repeated application of caustic before the patient was seen. In this case the tumour was of great size, involving the submaxillary gland and some of the lymphatic glands of the neck. The submaxillary gland was completely extirpated, the muscles arising from the styloid process removed in part, the transverse process of the atlas was completely exposed in the wound, the facial nerve divided, and the hypoglossal exposed, but the vagus was not seen. Twelve arteries and the

temporo-maxillary vein were tied. The patient recovered completely, and was well as long as heard of, though much disfigured by the facial paralysis.

The paper concludes with a description of the malignant tumour in each of the above cases; and, as a contrast, the history is given of a non-malignant tumour extirpated from the parotid region, and commencing apparently in disease of one of the lymphatic glands which are found imbedded in the parotid.

Successful extirpation of an hypertrophied spleen.—In the 'Gaz. Méd. de Paris,' 1867, p. 779, will be found the account of a successful operation, by M. Péan, for the removal of an hypertrophied an dcystic spleen. The operation was performed on Sept. 6, 1867, on a young female, æt. 20, much reduced by two years' illness. The malady was mistaken for ovarian disease, the swelling occupying the hypogastric region, and exactly resembling the pregnant uterus, and being surrounded on all sides by organs resonant to percussion. Paracentesis had not been employed, but it was afterwards ascertained that the fluid exactly resembled that of an ovarian tumour, so this would not have assisted the diagnosis. The incision was made in the linea alba, from the umbilicus to the pubes, and the cyst punctured through the omentum, which was too closely adherent to be separated. Three "litres" of a viscous, yellowish-brown fluid were evacuated. The hand was then introduced, and it was discovered that the cyst was independent of the ovaries, kidneys, or mesentery. The incision being extended two inches above the umbilicus, it was ascertained that the spleen was the diseased viscus. The surgeon determined to remove the spleen, but the unfavorable position of the wound and the great size of the tumour obliged him to do this in two parts. Remembering the fact that the arteries do not anastomose in the different portions of the spleen, he tied those which were distributed to the cyst and the large veins which crept over its surface (one of which was as large as the thumb) as near as possible to the front portion, and then removed two thirds of the spleen without any effusion of blood. The second stage consisted in excising and then cauterising with the actual cautery the remaining third, which was done after placing four metallic ligatures on the gastro-splenic omentum to embrace all the other vessels, as far as possible, from the great end of the stomach and the tail of the pancreas. The wires were cut short and left in the abdomen. The wound was completely closed. The operation lasted two hours. The portion of the spleen in which the tumour was implanted weighed more than two kilogrammes. She made a good recovery, and had been seen in perfect health by M. Nélaton and other medical men. The report is about two months after the operation. The only direct consequence of the operation seems to have been painful œdema of the left limb, which was transitory. She also suffered from facial neuralgia and epistaxis, but soon regained complete health.

Bryant, excision of the spleen for leucocythæmia.—In the 13th vol., 3rd ser. (1868), of 'Guy's Hospital Reports,' p. 411, Mr. Bryant relates

a second case in which he excised an enlarged spleen, in a case of leucocythæmia occurring in a woman, æt. 40. In this case, as in the one previously operated on by Mr. Bryant, death took place from hæmorrhage.* Here, however, the bleeding was even more formidable. It proceeded from a mass of adhesions between the enlarged spleen and the diaphragm, and was so copious that it was impossible to control it, and the patient bled to death in fifteen minutes. On examination of the body the lymphatic glands generally were found diseased, as were also the kidneys and liver. Mr. Bryant's conclusions with regard to the propriety of performing this operation are important enough to justify extraction :—"We have thus learnt two things from the cases related. First, that the enlargement of the spleen in leucocythæmia appears to be only part of a general disease affecting the glandular system as a whole; and, secondly, that in splenotomy for such a disease there is a disposition to hæmorrhage with which surgery is incompetent to deal. . . . . Under such circumstances there is no shirking the conclusion that the operation is physiologically unsound and surgically unsafe, and for leucocythæmia should not be performed." He then proceeds to refer to a case operated on by Dr. Kœberlé, of Strasburg, and related in the 'Med. Times and Gaz.,' Nov. 1, 1867, in which the patient also died of hæmorrhage from ruptured adhesions, and he observes that the success of M. Péan's case does not invalidate his conclusion; for though it shows that the spleen may be successfully removed in the human subject, the operation was not undertaken for leucocythæmia.

The 'Gazette Hebd. de Méd. et de Chir.,' Oct. 23, 1867, contains an account of M. Kœberlé's case. In this report M. Kœberlé refers to six operations of this sort by Fantoni, Zacharelli, Quittenbaum, Kuchler, S. Wells, and Péan (being probably unaware of Mr. Bryant's first case), in three of which recovery ensued.

As bearing on the removal of abdominal tumours, we may refer to the 'Path. Soc. Trans.,' xix, p. 243, where Mr. Spencer Wells relates a case of fatty tumour of the mesentery, weighing 20 lb., which he removed during life, with a fatal result; and in the same volume, p. 246, Mr. Cooper Forster relates a case in which there was a fibro-fatty tumour in the abdomen, weighing 55 lb. (the attachments of which were not ascertained), in which the sensation so exactly simulated that of ascites that paracentesis was performed.

Œsophagotomy for the removal of foreign bodies.—Dr. D. W. Cheever, of Boston, U.S., has published there an extremely interesting pamphlet with the above title, containing the account of two cases in which he had himself occasion to perform this operation, together with references to all the cases which he could find in published works.

Dr. Cheever's own two cases may be thus summarised:—The first patient was a young man who had swallowed a bone on Nov. 9, 1866. Seen next day. Great pain complained of, radiating from a part of the throat near the cricoid cartilage; nothing to be felt with the finger. He could swallow fluids. A sponge probang could be passed beyond

* See the last 'Biennial Retrospect,' p. 221.

the seat of mischief, but it gave him great pain. His sufferings were so great that the operation was performed on the third day. The side of the œsophagus having been exposed in the usual way,* a stomach-pump tube was passed into it, to make its walls tense. The tube passed down beyond the foreign body. A fish-bone was detected lying between the tube and the spine. This was extracted by carefully pricking through the walls of the œsophagus. The patient recovered, the fistula which at first existed, and allowed of the escape of a part of the food, having healed in three weeks.

The second case occurred only four days afterwards. It was that of a young man who had swallowed some foreign body in a piece of cabbage. The symptoms were very much the same as in the last case, viz. great pain, referred to the region of the cricoid cartilage, and great difficulty in swallowing, but fluids could be swallowed. The obstructing body was not to be felt with a probang, which would pass beyond it. The operation was performed on the third day, the incision being made from the left side. The œsophagus was very distinctly exposed, but no foreign body was contained in it at the point which was reached. A vertical incision was then made on to the stomach-pump tube, which was lodged in the œsophagus, and the finger passed down, the tube being withdrawn for the purpose. Nothing was to be felt above the wound, but opposite the manubrium of the sternum a pin was found imbedded in the walls of the œsophagus, and was with much difficulty removed. The patient made a rapid recovery.

Dr. Cheever adds a table and references to 15 cases besides his own—viz. 1 by Goursalt in 1738, 1 by Roland (date not known), 2 by Bégin in 1832, 1 by Arnott in 1833, 1 by Lavacherie in 1844, 1 by Martini and 1 by Delarocherie in 1845, 1 by Antoniesz in 1853, 1 by Demarquay in 1854, 3 by Syme in 1855, 1861, and 1862, 1 by Cock in 1856, 1 by Flaubert in 1857. Of these, Arnott's, performed five weeks after the accident, Martini's, on the fourth day, Dumarquay's, on the tenth, and Flaubert's, on the ninth, proved fatal.

To these should be now added a second case by Mr. Cock, published since the above pamphlet was written, and reported in the last volume of the 'Guy's Hospital Reports,' xiii, 3rd series, 1868, p. 1. The patient recovered, making 4 deaths in 18 cases.

Dr. Cheever adds a very full and instructive discussion as to all the points connected with the operation, and urges the danger of delay when once the lodgment of a foreign body has been clearly proved; and this is also Mr. Cock's conclusion from his experience. Mr. Cock is also decidedly in favour of nourishing the patient by means of a stomach-pump tube passed beyond the wound, even from the day of the operation, and attributes the speedy recovery of both his patients in great measure to this treatment.

Connected with the subject of foreign bodies in the œsophagus, we may refer to a case related in the 'Path. Soc. Trans.,' xix, 219, in which a soldier swallowed a piece of bone, which lodged in the œsophagus opposite the arch of the aorta. He died suddenly on the fifth day from

* If we understand right, the operation was performed on the right side in this case.

profuse vomiting of blood, the result of the bone perforating the aorta during a slight exertion.

Amputation at the knee-joint.—In the 'Brit. Med. Journal,' Jan. 5, 1867, Mr. Longmore refers to the experience of army surgeons in the Crimean and American wars as to this operation. With reference to the Crimean war, Mr. Longmore says the number of cases in which amputation at the knee-joint was performed in the British army was so limited that hardly any statistical deductions can be made from their results. The columns in the 'Returns of Amputations,' and their ratios of mortality in the official report, show there were only 6 primary amputations at the knee, of which 3 proved fatal or 50 per cent.; and 1 secondary, which proved fatal, or 100 per cent. With such small numbers, statistics are of little use. Nothing could better prove this than the circumstance that, if this secondary case had survived, the recoveries after secondary operations would have appeared as 100 per cent. in the official return.

In the French army amputation at the knee was resorted to much more frequently than in the English army. Dr. Chenu, of the French military medical service (who undertook, and who has admirably executed, the herculean task of compiling the statistics of upwards of 400,000 admissions into the French hospitals during the Crimean war), has traced the results of 69 amputations of the knee-joint in a special table. Of these he shows that 63 proved fatal; a ratio of mortality of 91 per cent. Dr. Legouest, in his 'Traité de Chirurgie d'Armée,' p. 735, refers to 78 cases of amputation at the knee-joint in the French army during the Crimean war; but Dr. Chenu's returns have been so carefully elaborated that his numbers are doubtless the more correct. It is of no importance, however, as regards statistical reference, which number is right; for in each the ratio of mortality is the same. Dr. Legouest's table records that, of the 78 cases, 71 died, showing therefore a mortality of 91 per cent., the same as Dr. Chenu. Hence, Dr. Legouest affirms, amputation at the knee should be abandoned, and amputation of the thigh employed instead.

The statistics of the American war are then quoted, as they are to be found on p. 224 of our former Retrospect, showing a per-centage of mortality in primary operations of only 34·9 per cent. out of 49 cases, and in secondary operations 64 known deaths out of 132 cases, some of which were incomplete.

Mr. Longmore's general conclusions about this amputation are thus expressed:—"I have a very strong hope that in any future war amputation at the knee-joint will be performed more frequently than it has hitherto been performed by surgeons in our own army, and with results at least as favorable as those recorded in the United States army reports. Mr. Syme has recently pointed out so fully the safety and the excellent results of Mr. Carden's single skin-flap amputation at the knee, and the operation avoids so many of the difficulties and untoward circumstances which attend the ordinary mode of performing the operation, especially under the conditions of campaigning, that I trust Mr. Carden's operation will not be forgotten in our future field surgery.

There are so many kinds of gunshot injury to which it is applicable, and for which amputation of the thigh is now practised—cases of laceration at the upper part of the leg on its posterior aspect, preventing the formation of an underflap cut from the calf on the old plan; penetrating wounds of the articulation by bullets when the end of the femur has only received superficial injury; fractures at the upper part of the tibia complicated with lesion of the principal blood-vessels or involving its articular surface—that, if it be adopted, I anticipate a considerable saving of life will result; on the one hand, by proportionably avoiding the high rate of mortality accompanying amputations of the thigh; and on the other hand, from the intrinsic safety of the operation, according to Mr. Carden's plan."

In the 'American Journal of the Med. Sc.' for April, 1868, will be found an elaborate paper by Dr. Brinton, of Philadelphia, embracing all the points connected with this operation—its mortality, its indications, the usefulness of the stump, and the various circumstances under which it has been practised in America and elsewhere. The conclusions of the writer are, on the whole, highly favorable to this amputation.

On amputation of the thigh, with a flap containing the patella.—In the 'Annali Universali de Medicina,' 200, p. 368, will be found a paper by Dr. Melchiorj, of Salò, on the advantages of preserving the patella in the anterior flap of the amputation of the thigh. The cases related in this paper are 3 in number. In the first the amputation was performed on account of a malignant tumour in the calf of the leg. The limb was amputated through the knee-joint (the first case of the kind, as its author believes, in Italy). The recovery was somewhat retarded by necrosis of the articular cartilages of the femur, but the patient was well in forty-two days, and the stump would have been most useful. However, the cancerous tumours recurred in the abdominal viscera, and she died 4½ months after the operation. The patella was found deprived of its cartilage, and bound down by adhesions in the intercondyloid notch, so as to have little mobility. The skin of the flap adhered to the condyles. The next case was that of a man injured in a railway accident. Here it was proposed to have amputated below the spine of the tibia, but the injury of the bones was found to extend into the knee-joint; and as one of the femoral condyles was fractured, it became necessary to saw the femur through at the level of the condyles. The anterior flap sloughed, and recovery was very slow. Ultimately, after much exfoliation of bone, the patella became anchylosed to the outer part of the femur; the lower end of that bone became reduced in volume by atrophy and exfoliation, the cicatrix was adherent to the bone, and at first extremely prone to ulceration. An artificial limb was applied, taking its bearing from the ischium, the stump being used merely in raising the limb, and with this the patient walked extremely well. He was last seen about five years after the amputation. The author contrasts the result of this case with that of three cases in which the thigh had been amputated by the ordinary flap or circular methods, to show how much more power this patient had of moving his

artificial limb forward in walking by the action of the great quadriceps extensor. The third amputation was performed for diffuse inflammation after a gunshot fracture of the tibia. Here the articular portion of the patella was sawn off, its non-articular part being left, and the femur having been divided above the condyles, the sawn face of the patella was applied to it. The recovery was very slow, but when complete the stump was exceedingly useful, and he could walk long distances without fatigue.

The author prefers, in amputating near the knee, to divide the femur above the condyles, inasmuch as the surface exposed by the section through the condyles is too large to be covered by the section of the patella, which he applies to the femur, so as to produce osseous union. He dwells upon the advantages of this defence to the end of the stump of the femur in supporting the artificial limb, and the utility of the patella as affording a point of action for the quadriceps extensor muscle, and rendering progression more easy.

Amputation at the hip.—In 'Langenbeck's Archiv,' ix, p. 250, will be found the account by Herr Petechin of a case of successful amputation at the hip-joint on account of acute periostitis and osteomyelitis of the femur. The patient was a lad, æt. 17, who had been attacked with what was thought to be acute rheumatism in the knee. This turned out to be acute periosteal abscess of the femur, and he was suffering so much under pain and suppuration that amputation was decided on about five weeks after the commencement of the attack, and was performed close below the trochanter. The thickened condition of the periosteum, together with the redness and prominence of the medulla in the stump of the femur, decided the operator to remove the latter, which he did by dissecting it out of the joint. The patient made a favorable recovery. After the operation the stump was so movable that he was able to use a common wooden leg, but this was afterwards found to be heavy, and as he grew did not fit him, and so was laid aside. The method of amputation was by a circular skin incision, with flaps of the muscles. The first incision was only a little above the middle of the thigh, and it was probably to this great length of the stump that its mobility was due.

In the 'Medical Times and Gaz.,' Nov. 2, 1867, Prof. Fayrer, of Calcutta, relates a case in which a young man, æt. 21, received a wound of the knee-joint on June 24. The thigh was amputated on July 2. The bone where divided was found to be stripped of its periosteum by the slightest manipulation, and was, therefore, divided again two inches higher up. He had rigors on the following day; the temperature was high, 101°; the breathing was hurried; dulness in the upper right side of chest, with moist râles. There had been a good deal of oozing of blood, distending the flap. There were all the other symptoms of osteomyelitis. Amputation at the hip-joint was performed, but the patient died the same evening. His death was attributed by Prof. Fayrer to accumulation in the right side of the heart of blood-clots, such as, he believes, frequently form in conditions of blood poisoning.

A successful case of excision, followed by amputation of the hip, for

morbus coxarius, at the age of 11, is related by Mr. Barnes, of Liverpool, in the 'Lancet,' i, 1868, p. 190.

For all matters connected with excisions of joints see below, with the diseases of the organs of locomotion.

The following extracts refer to matters connected with surgical pathology:

On traumatic fever.—In 'Langenbeck's Archiv,' ix, 1867, p. 52, Dr. Th. Billroth completes his work on traumatic fever. He commences with a reference to the two previous portions, of which a notice has been given in the 'Year Book' for 1862, p. 183, and in the 'Biennial Retrospect' for 1865-6, p. 230. He also recites the conclusions arrived at by Prof. O. Weber, of which an account will be found in the 'Year Book' for 1864, p. 227. The present work (of which our space will only allow us to give the briefest possible account) consists mainly of three chapters, the first (18th of the whole work) referring to simple traumatic fever, in which the author shows the importance, with reference to the theory of fever, of those cases of severe injuries in which the fever is absent. He then proceeds to prove that in about 87 per cent. of the cases in which fever does occur it comes on during the first forty-eight hours, that it terminates usually on one of the first seven days after its origin, and not more often on one of these days than on another, frequently, however, lasting longer than the seventh day, and passing directly into secondary fever, this being occasioned by some accidental inflammation or suppuration; that the highest temperature occurs commonly on the first or second day, hardly ever later than the fifth, and that this fever has no definite type. The next chapter (xix) refers to the "infection-fevers," which are usually fatal, and which he divides into—1. "Septicæmia," or the fever of putrid infection. 2. Suppurative fever, or the fever of purulent infection; and 3. Fever of purulent infection, with thrombosis and embolism, or pyæmia. —The first form of fever is marked by the following characters: The temperature is usually very high at first, and later on sinks very low; but there are cases in which the temperature is low from the first, and never rises very high—nay, even may never have been above the normal—while the dry tongue, the oppressed sensorium, &c., show the gravity of the infection. In experimentally produced septicæmia the temperature rises rapidly for two to six hours, then gradually sinks often below the normal, with simultaneous diarrhœa. Death may occur at any point of this change of temperature. He explains conjecturally the variety in the phenomena of this fever by the various doses of the putrid material which the individual may have absorbed, referring to Weber's experiments on the effects of injecting sulphuretted hydrogen and butyric acid. Septicæmia rarely, perhaps never, occurs later than the fourth day after the injury. 2. With regard to the fever of purulent infection, its most striking characteristic is the recurrence of rigors with intermissions. Experiments on animals do not serve to elucidate this type of fever, as they give very various results. Man appears more prone to irritation from purulent infection of the blood than animals. The latter cannot be provoked to recurrent rigors by any single injec-

tion of the products of putrefaction. With respect to the cause of the intermissions, he alludes to two theories, according to one of which the poison accumulates in the blood and does not occasion rigors till it has reached a certain dose, while according to the other the poison accumulates in the spleen and is discharged thence into the blood in the occasional passage of the contents of the spleen into the general circulation. The author, however, thinks it more probable that each rigor is caused by a fresh inflammation, whether in the wound or some other part of the body. This theory is reconcilable both with the results of experiments and with clinical observation. He lays great stress upon the fact, which can be verified by the continuous observation of the temperature during the day in cases of purulent infection, that attacks of fever, marked by rise of temperature, frequently occur without any rigor; therefore the intermittent type so characteristic of this fever is not excluded by the absence of rigors. 3. The combination of the fever of purulent infection with the recurrence of thrombosis and embolism is, according to him, the definition of pyæmia. In this form of fever he believes that all the metastatic abscesses are due originally to embolism. The objection that such abscesses are found in remote organs when none are found in the lungs, and that embolic bodies which are too small to pass the capillary vessels of the spleen, &c., ought to be arrested in the lungs, he disposes of by an experiment in which he injected matter from a cancerous breast into the jugular vein of a dog. After death deposits were found in the spleen, but the lungs were quite free. He next proceeds to consider how the thrombosis occurs, and how pus can find its way into the blood. On the first head he does not come to any positive conclusion; but on the second point he refers to experiments showing the possibility of the passage of pus, as such, through the walls both of the veins and lymphatics. Then follows an elaborate digest of the symptoms, post-mortem appearances, and ætiological conditions (such as sex, age, season of the year, &c.) in 180 cases of these three forms of infection-fever; and he concludes with a chapter on the treatment, prophylactic and curative.

Dr. Billroth's 20th chapter deals in a similar manner with the phenomena of erysipelas, and (but much less fully) with those of lymphatic inflammation and tetanus. In an appendix will be found a few observations of the temperature in various diseases—viz. injuries of the spine and head, peritonitis, acute nephritis, and rigors after catheterization.

In the 'St. George's Hospital Reports,' iii, p. 73, will be found a paper by Mr. Pick on traumatic fever, in which, besides confirming Billroth's general accuracy by his own observations, he endeavours to show the differences in the phenomena of the secondary surgical fever, according as it depends on local inflammatory action about the wound, on pyæmia, phagedæna or erysipelas. In the first the temperature gradually rises up to its highest point, and then subsides immediately on the establishment of a free and healthy discharge. In pyæmia the temperature exhibits remissions and exacerbations corresponding to the intermittent character of the fever. Phagedæna is marked by a gradual rise of temperature, sometimes to a very high point (105°-106° F.), followed by a sudden fall to the normal temperature, or even below

it. All this precedes by about 24 hours the appearance of the sloughing. In erysipelas the fever does not present any constant type; it precedes the appearance of the eruption by only a very short time, continues high during its whole course, and then subsides rapidly.

Cancer.—The following papers on cancer appear worthy of notice:—"On the Manner of Inheritance of Cancer," by W. Morrant Baker ('Brit. Med. Journ.,' April 27, 1867).

This paper is in reply to Mr. Moore's pamphlet 'On the Antecedents of Cancer,' of which an abstract was published in our last Retrospect.

Mr. Baker observes, in the first place, that it is not necessary to the support of the theory that cancer is a constitutional disease to prove that it is handed down as cancer from parent to child. The constitutional tendency may be transmitted without any transmission of the actual disease.

"Mr. Paget has put this fact very plainly. 'That which is transmitted,' he observes, 'from parent to offspring is not cancer itself, but a tendency to the production of cancer at some time far future from the birth. We have no reason to believe that a cancerous material passes with the germ. To suppose such a thing, where the cancerous parent is the male, would be absurd. Moreover, no reason to believe that cancerous material passes from either parent is furnished by any frequency of congenital cancer.'" ('Lectures on Surgical Pathology,' 2nd edit., p. 774.)

Thus, the argument that if inheritance had much to do with cancer, it would be more common in infants and young children, does not seem a very strong one. Cancer appears to be transmitted in the same way as other diseases, *i. e.* by the inheritance of a tendency, which may not appear till late in life, or may pass over one generation to appear in the next. "So far as the fact can be proved by statistical records, this is certainly the usual way in which it is handed down from generation to generation; and if argument from analogy be admitted, this is the manner in which, from observation of the inheritance of other diseases, we should expect it to be transmitted."

But Mr. Baker points out that the mere fact of cancer being a heritable disease no more shows that it is a general, and not a local, disease than the same fact which has been often observed in epidermal cysts, crooked fingers or toes, hernia, &c., would show that they are constitutional affections. The proportion shown by Mr. Paget's most recent statistics ('Med.-Chir. Trans.,' 1862) gives 24·2 per cent., or about one fourth, as the proportion of cancerous patients who were aware of the occurrence of this disease in other members of their family; and this proportion Mr. Baker is inclined to believe to be below the reality, on account of the number of persons inheriting cancerous tendencies who die from other causes before such tendency has revealed itself, and on account of the number of cases of internal cancer which escape detection. Mr. Baker quotes Mr. Moore's statement of the case, which he says is a very fair one. Mr. Moore remarks ('Antecedents of Cancer,' 1865, p. 20), "If it be usual for dissimilar cancers to prevail in direct inheritance,—for the children of cancerous parents to have primary cancer of various

organs—then cancer passes from parent to offspring as a general and not a local disease. It belongs indifferently to all the body. Its constitutional nature is established." And he then proceeds to say that such is not the result of his experience, although he is not in a position to state the fact numerically. In his later paper ('Brit. Med. Journ.,' Dec. 1, 1866), he supplies the want by a relation of 24 cases of cancer, which occurred in the relatives of cancerous patients who were under the care of various members of the British Medical Association. "One half of these multiple cancers, in related persons, occupied similar, and one half dissimilar, organs."

Mr. Baker then proceeds to give a summary of Mr. Paget's practice from the 'Bartholomew's Hospital Reports,' ii, 1866:—"They have been collected from those of his cases in which any information of the kind had been recorded, and have been arranged in the order in which they occurred, without reference to any particular result. It is unnecessary to quote the whole table, which may be found in the place to which a reference has been given. It will suffice to say that altogether I have been enabled to tabulate 83 cases in which the occurrence of cancer, in more than one member of a family, had been recorded, together with the situation of the cancer in the relatives affected. Examination of the cases gave the following result:

"There were altogether 45 instances (in 41 families) of direct inheritance from father or mother; and of these the disease was in the same organ in both parent and child in 19, and in different organs in 26 instances.

"It is a curious fact that in all the cases but one, in which the disease occupied the same site in both generations, the breast was the organ affected; the exception was the uterus. As might be expected from this fact, almost all these patients were females, only one case occurring of cancer of the breast inherited by a male.

"Among the cases of direct inheritance from a parent, but in which the disease was transmitted to a different organ in the child, 9 were instances of inheritance from the father and 17 from the mother.

"There were 16 instance (in 14 families) of inheritance from a grandparent, or great-grandparent, or both; of these, 8 were cases of cancer in the same, and 8 in a different, organ in the two generations. As before, the cases of disease of the same site in both generations were cases of cancer of the breast, with a doubtful exception.

"There were 49 families—some of them have been included in the former statement—2 or more members of which had cancer, the relationship between whom, however, was not that of parent, or grandparent, and child. Of these, 28 were families in which the disease was seated in the same organ in all the relatives affected; 21 in which different organs were attacked.

"There were 25 instances of the disease in brothers or sisters, or in brother and sister. In 14 of these the same organ suffered in both the relatives affected; in 11, a different one.

"The whole of the 28 instances of cancer of the same organ, in all the affected relatives, were cancer of the female breast; and 14 of them were in sisters.

"Taking the whole of the cases together, in which cancer occurred in relatives, one half, almost exactly, occurred in similar, and one half in dissimilar, organs in the affected members of the same family.

"Taking only the cases of direct inheritance from a parent—and these are, of course, the more conclusive—the number of instances of unlike cancer in parent and child is found to preponderate over those in which they were alike.

"Now, it is difficult to see how any evidence, so far as it goes, can be more conclusive. It is equally difficult to see how this evidence of cancer being not merely a local disease can be resisted. The only way in which it can be resisted, or shown to be not conclusive, must surely be by doubting whether inheritance has anything whatever to do with the matter; or—and this is a less reasonable alternative—by assuming that the instances of cancer, similar in the offspring to that in the parent, are cases of true inheritance; and that those of cancer, unlike in parent and child, are simply coincidences, and nothing more.

* * * * * * * *

"If we may believe, on the present evidence, that cancer is really inherited in a large number of cases, and that, in the transmission of the disease in this way it happens, as often as not, that a different organ suffers in the offspring from that affected in the parent, how can the theory be maintained that cancer is a local malady?

"The fact that, among inherited cases, cancer is so frequently in the same organ in both parent and offspring is no evidence for its merely local nature. The occurrence of tuberculous disease in the lung, and of gout in the great toe, in successive generations, may be fairly taken to prove for what parts these diseases have a special liking, but is scarcely a sign either of their local nature or of their transmission by inheritance as local diseases. And it is not easy to understand why, under analogous circumstances, cancer, and not gout or phthisis, should be considered a local disease."

In the 'Med.-Chir. Trans.,' l, p. 245, will be found a paper, by Mr. Moore, on "Inadequate Operations for Cancer," in which a series of cases of operations for cancer of the mamma are reported, intended to establish the following conclusions:

"That the recurrence of cancer is due to local conditions.

"That these conditions are not regional, so as to belong to structures out of continuity with the first tumour.

"That neither are they organic, whether as indiscriminately involving the residue of a mamma operated upon, or so as to be transferable to the second breast in consequence of the removal of that first affected.

"That, on the contrary, recurrent cancer begins near the scar.

"That when free in both directions, it tends towards the axilla earlier than to the residue of the breast.

"That consequently centrifugal dispersion, not organic origin, determines the recurrence of cancer.

"The practical conclusions are, that cancer of the breast requires the careful extirpation of the entire organ; that the situation in which this operation is most likely to be incomplete is at the edge of the mamma next the sternum; that, besides the breast, unsound adjoining

textures, especially skin, should be removed in the same mass with the principal disease."

In reference to Dr. Broadbent's plan of treating cancer with acetic acid, noticed in our last 'Retrospect,' p. 226, Mr. Moore gives several instances in which, after apparent success, the disease has reappeared, and made a rapid progress; and in two papers in the 'Brit. Med. Journ.,' for Feb. 9 and June 1, 1867, Mr. Moore dwells upon the impropriety of using acetic-acid injection as a primary measure, and on the danger of delay in operating.

The following extracts relate to affections of the mouth, nose, and larynx:

Staphyloraphy.—Mr. T. Smith contributes a paper to the 'Med.-Chir. Trans.,' li, p. 79, on the cure of cleft palate by operation in children, with a description of an instrument for facilitating the operation. Mr. Smith's instrument consists of a plate placed upon the tongue and connected with two branches, each of which carries a plate resting on the upper and lower teeth of each side, these branches being moved on each other by a hinge, which is opened by a rack-and-pinion movement. The branches meet at an angle (when the screw acts), and this rests in the corner of the mouth. The whole is secured by a strap round the head. The instrument takes up hardly any room, and is very useful for other operations on the mouth. The patient being brought fully under chloroform, the gag is introduced and opened widely. Then the edges are pared from below upwards, and the sutures are introduced (which Mr. Smith makes of fine fishing-gut or horsehair); then the flaps of the palate are held by means of the sutures, while incisions are made to divide the muscles; and if the flaps do not come easily together, a lateral oblique cut is made on either side. The parts are now sponged out and the sutures tied. Mr. Smith gives a table of 11 cases in which he has thus operated. The earliest age was 2 years, but the operation did not succeed. A successful case at 2 years 11 months and another at 3 years 2 months are reported.

In the 'Brit. Med. Journ.,' 1868, p. 131, Mr. Collis, of Dublin, calls attention to an article by him in the 'Dublin Quarterly Journ.,' xliv, p. 345, in which he mentions having used chloroform successfully for staphyloraphy in childhood.

In the 'Transactions of the Clinical Society,' i, p. 173, Mr. Callender describes his method of operating, which consists in dividing the muscles of the soft palate freely on both sides five days before paring the edges and bringing the parts together. The muscles are still inactive, and there is no bleeding to complicate the final operation, which can be readily and quickly performed under chloroform.

Naso-pharyngeal polypus.—In the 'Gaz. des Hôp.,' 1867, p. 97, M. Hergott, of Strasbourg, relates a case of naso-pharyngeal polypus attached to the basilar process, to show the use of the laryngoscope in some cases of this affection, and the direct access which may occasionally be obtained to the pedicle of the tumour through the anterior nares—that is to say, when the tumour is attached to the basilar process. In this

case the tumour, which was of no large size, passed down to the velum palati. The uvula was little sensible, so that it could be handled with a pair of forceps without giving the patient much pain. It was quite easy with the laryngoscope to see the implantation of the tumour into the base of the skull. A ligature was placed upon it near the bone, and the polypus came away in a few days. It recurred, however, a year afterwards, and was again similarly removed. The point of its implantation was easily visible with the laryngoscope, and M. Herrgott wished to rasp the bone at this point. On trial he found that an instrument passed through the anterior nares impinged exactly upon this point, and on referring to a skull he saw that this is the normal relation between the anterior nares and the basilar process. The bone was easily denuded, and on examining the patient seven months afterwards no trace of reproduction was visible.

On the subperiosteal operation for removing naso-pharyngeal poylpi.—The following note of Signor Larghi is quoted in the 'Gaz. Méd. de Paris,' 1867, p. 617, from the 'Giornale della R. Acad. di Med. di Torino,' No. 6, p. 326, 1866.

The anterior opening of the upper jaw-bones is the most natural way to extract naso-pharyngeal polypi. To accomplish this, the upper lip is to be turned upwards and backwards, and an incision to be made into the gingivo-periosteal tissue above the alveolar border of the anterior and lateral surface of the two upper jaw-bones; their periosteum is to be stripped off, and with the lever the anterior inferior nasal spine is to be raised up. If necessary, the inferior insertion of the vomer is also to be detached and raised with the lever, and carried to the right or left side according to circumstances. If, from the size of the tumour, the opening so described is not sufficient, the periosteum of the edges of the maxillary bones being already detached, as much as is requisite of these bones is to be removed.

By this method the face is left intact and the palate is not injured, parts which are spoiled by the methods previously in use.

On plugging the posterior nares in operations on the face.—In the 'Gaz. des Hôp.,' 1867, p. 370, will be found a communication which M. Verneuil made to the Acad. Imp. de Médecine, on the precautions to be observed against hæmorrhage in certain operations on the face. He says that, in order to avoid the bad effects of hæmorrhage, and to give the patient the benefit of complete anæsthesia throughout such operations, he has proceeded as follows:—First, he divides these operations into three classes—(1) Operations involving the nasal fossæ only. In these he begins by plugging the posterior nares. (2) Those which only interest the walls of the mouth. Here he reserves to the last the incisions which penetrate into the mouth. (3) In operations which implicate simultaneously the mouth and nose he combines both precautions. He refers to 11 operations, of which 5 were on tumours of the ala nasi, nasal fossæ, or the cavities in communication with them; 4 on tumours of the lips, cheeks, or floor of the mouth; and the other 2 tumours involving the upper jaw as well as the palatine

vault, and calling for partial resection of the upper jaw. In these latter operations he was able to employ chloroform and keep the blood out of the mouth for 9-10ths of the time; but he allows that for complete extirpation of the upper jaw the plan is insufficient.

The nasal fossæ should be plugged before chloroform is given, and the surgeon should assure himself that they are completely plugged. As soon as the bleeding has ceased the plug should be withdrawn. Its further retention could only embarrass the patient. If the septum is perforated, or the operation involves both nasal fossæ, both nostrils should be plugged.

Foreign body in posterior nares.—In the 'British Medical Journal' for Sept. 7 and Sept. 28, 1867, two cases are reported of a very similar nature, in which a metal ring (in one case a steel purse ring, in the other a brass ring of similar shape) was impacted in the posterior nares. In the first case, under the care of Mr. Lowndes, of Liverpool, the body was detected soon after its lodgment, and was easily extracted under chloroform, by pushing it into the pharynx with one hand, and receiving it in the finger and thumb of the other. The second case, under Mr. Hickman's care, was of more interest, since the ring had been lodged for $13\frac{1}{2}$ years, since the age of 2, and the girl had been under medical care during the greater part of the time:—The following history was obtained from the mother. Thirteen and a half years previously, when not quite two years old, the child was seized with a choking fit whilst at play, and ran to her mother endeavouring to attract attention to her throat; the mother thrust her finger into the child's mouth and felt distinctly the circular outline of a ring, but it immediately escaped from her touch and she could not bring it out, and, as the choking symptoms subsided, she concluded it must have been swallowed. It was never detected in the motions, however; and in the course of a week or two a brownish discharge took place from the nose, so the child was taken to a medical man, and afterwards to several others, but all assured the mother there was nothing lodged. From that time the child had always been ailing, and was with difficulty reared, a delicate strumous-looking girl. The discharge from the nose diminished and became colourless, but continued; the nose became quite impervious to air, so that the mouth was noticed to be always open; she became very deaf, lost the sense of smell, and was continually having attacks of sore-throat, and at last the breath became so offensive that she was not allowed to attend school, and could get no other children to associate with her. During all this time she was constantly being taken to different medical men, and was treated for sore-throat, ulcerated throat, enlarged tonsils, fissure of the palate, polypus of the nose, &c. &c.—the mother's account of the accident with the ring being made light of, until at last, as she said, she was almost ashamed to relate it. The child remained a month in one of the provincial infirmaries, and had one of her tonsils excised; the other was also to have been removed, but that she was obliged to return to London with her parents.

On rhinoscopic examination Mr. Hickman found the soft palate much swollen, especially on the right side, and there was a fistulous

opening in it. A wide square-outlined black object was at once seen in the naso-pharyngeal space. It felt quite hard to the probe; the fingers could only just reach it. An attempt to extract it, as in Mr. Lowndes' case, proved ineffectual, but it was got out by means of a double-curved long probe. She improved greatly in general health; her smell and hearing, which had been impaired, were restored; and the only remaining annoyance was the regurgitation of fluids in deglutition, in consequence of the fistula in the soft palate. This, however, was relieved by dividing the fistula.

Tracheotomy.—M. Baizeau relates, in the 'Gaz. des Hôp.,' 1867, p. 397, two examples of successful tracheotomy for croup under the age of 2 years, viz. on infants 10 months and 15 months old. The operations were performed in Algiers, where he says he had occasion to operate 12 times, with 4 successes. He refers also to another successful case, at the age of 15 months, in the practice of a colleague.

The following extracts refer to affections of the locomotive organs:

Dislocation of the hip.—In the 'Brit. Med. Journ.,' Jan. 11, 1868, Mr. Holmes Coote speaks of the reduction of dislocation of the hip by manipulation. After instancing various cases in which this treatment had been followed, and insisting on its advantages, Mr. Coote goes on to say:

"I shall confine my remarks to dislocations at the hip-joint; although *mutatis mutandis*, they are equally applicable to similar accidents at the shoulder-joint.

"There is but one primary dislocation of the femur at the hip-joint; namely, that in the foramen ovale or downwards and inwards. There the capsule is weakened, and the rim of the acetabulum least prominent. When the whole limb is extended all the ligaments are tense, and the direct abduction is a very limited movement. A person in the sitting posture may rotate and evert the limb to a much greater extent; but that is not the position in which a dislocation usually ensues. A heavy weight falling upon the hip may, and often does, drive the head of the bone through the inner surface of the capsule, producing a rent at the inner and posterior part, which must be sought for and found before the head of the bone can be replaced.

"In illustration of this remark, I will briefly enumerate the following specimens from the museum of the hospital. Series iii, No. 20. Dislocation of the head of the femur upon the ischiatic notch. The opening at the capsule is situated at the posterior part of the joint. No. 68. Dislocation of the head of the femur on the spine of the ischium. The opening at the capsule is situated at the posterior part of the joint. No. 25. Dislocation of the head of the femur on the lower edge of the obturator externus muscle. The opening at the capsule is situated at the inner side and lower part of this joint.

"Possibly, among primary dislocations, we should include dislocations of the head of the femur downwards and backwards as well as inwards, as illustrated by the following specimen. Series iii, No. 56. Dislocation of the head of the femur downwards and backwards, which oc-

curred 12 hours before death. The head of the bone is situated on the ischium, opposite to the lesser ischiatic notch and the upper part of the tuberosity. The tendon of the obturator internus is torn from its muscular fibres; some of the fibres of the pyriformis, gemelli, and gluteus minimus are also torn. There is fracture extending through the os innominatum near the acetabulum. The patient was a maniac who leaped from a third-story window. He died of other injuries received at the time. But in none of these specimens is the laceration of the capsule situated at the anterior or the outer part of the joint.

"The other forms of dislocation—namely, those on the dorsum ilii, the ischiatic notch, and on the pubes—are secondary, dependent either on muscular action or on the continuance of the dislocating force. The course of treatment is therefore obvious. Muscular rigidity having been overcome by the employment of chloroform, the head of the bone has to be worked down to the inner or the inner and posterior part of the capsule, where the rent will be found, and the replacement of the bone be effected. Muscular rigidity having been overcome by the use of chloroform, the leg should be bent at the knee and the thigh on the trunk, when, with a rotatory movement, the head of the femur may be easily made to retrace its course. Having succeeded in getting it at the inner aspect of the joint, the surgeon, with one movement, rotates the thigh outwards and suddenly extends the limb, when the head of the bone slips into the socket with a snap.

"These points were first demonstrated to me by Prof. Fabri. In the 'Brit. Med. Journ.' of Oct. 22, 1866, is a letter from Mr. Thomas Cuddeford, my late house-surgeon, confirmatory of that which I have here written."

In the 'Lancet,' i, 1868, p. 343, is the account, by Mr. Callender, of a case in which he reduced a dislocation of the head of the femur into the ischiatic notch by the process of manipulation described below, after the pulleys and the ordinary manipulation, in which the thigh is flexed and rotated outwards. Mr. Callender believes that in this latter process the head of the femur is caused to roll around the lower edge of the acetabulum to its inner side, bringing it to the obturator foramen, or even on to the pubes. Mr. Callender explains how this is done, and states that the ischiatic nerve has been known to be seriously crushed, and the bruising of the parts has been such as, in one instance at least, to give rise to subsequent disease of the hip-joint. The manipulation which he found successful was as follows:—"The thigh was bent on the abdomen, and I slowly moved the limb into a straight line with the body, so that the head of the bone could be felt projecting in the buttock, outside the tuber ischii. The limb in a straight line with the trunk, without allowing any rotation outwards, was then drawn forwards from the abdomen, and forced downwards (extended), and the head of the bone at once slipped into the acetabulum."

In the same volume, p. 617, is the account, by Mr. Powdrell, of a dislocation of the hip on to the obturator foramen, at the age of 6 months, reduced easily by manipulation, somewhat similar to the ordinary method of extension by the pulleys.

Mr. Hamilton exhibited, on Nov. 28, 1868, to the Dublin Pathologi-

cal Society, the preparation from a case in which a man, æt. 71, died of bronchitis about three weeks after the occurrence of a dislocation into the sciatic notch, which it had been found impossible to reduce after frequent attempts. The causes of the failure were as follows:—First, the rent in the capsule was so small that the head of the bone could scarcely be forced through it; secondly, the lower edge of the acetabulum was broken, so that it allowed the capsular ligament to yield before the head of the bone.

Simultaneous dislocation of both shoulders.—In the 'Med. Times and Gaz.,' Oct. 19, 1867, is the account of a case under Mr. Couper's care, at the London Hospital, in which simultaneous dislocation of both humeri occurred in a man, æt. 51, from an accident twelve weeks previously, in which, while standing on the edge of a waggon, with both arms outspread and the hands resting on neighbouring objects, in order to maintain the balance, the waggon moved on, and threw him on to the support of the outstretched arms. Both humeri were dislocated beneath the coracoid process. No attempt at reduction seemed to have been made. Mr. Couper made cautious extension on one of the arms, but as this failed to produce any good effect, and as the usefulness of the arms was considerable and was increasing, no further attempts at reduction were made. We must refer to the report of the case for the particulars as to the condition of the arms before admission and on the patient's recovery.

Dislocation of the shoulder-joint, with inversion of the humerus.—Dr. Cleland, of Galway, relates the following case in the 'British Medical Journal,' Feb. 15, 1868:—"Ten days ago I was summoned to the workhouse in the evening, to see a man who moves on crutches, having lost his left leg, and who had fallen, and was said by the master to have dislocated his shoulder. When I entered the ward I saw the patient, a robust middle-aged man, lying quietly on his back, with his right hand grasping the left above his head; and I turned to the master laughingly, thinking that he had been imposed on. On going up to the patient, however, it was easily seen that he had no power to move the left arm out of the position in which it rested; and it was found that he was pulling the hand to get relief from a violent pain on the side of the chest, at the lower part of the axilla. I passed my hand over the spot indicated, and found that this pain, which was that from which the patient principally suffered, was caused by the head of the humerus pressing on the thoracic walls, possibly on a lateral cutaneous branch of an intercostal nerve. The humerus, instead of being merely displaced from its socket, had been also turned round, so that the lower extremity was directed upwards and the head pointed downwards. The head rested towards the posterior wall of the axilla, about the level of the fourth rib, in front of the lower part of the scapula; and the bone being placed with its internal aspect outwards, it was easy to feel the smooth globular form of the articular surface and the neck of the bone lying immediately beneath the skin. The deltoid muscle naturally was very much relaxed, its attachments being greatly approximated; and the fingers could be

shoved in easily below the coraco-acromial arch. The patient having been made to sit up, there was no difficulty in depressing the arm to a position nearly at a right angle to the body, the head of the bone rising at the same time up to the axilla. I then placed my knee in the axilla, and pulled the limb towards me, when the dislocation was instantly reduced.

"A consideration of the manner in which the accident occurred in this instance will both explain how the particular lesion was produced, and why that lesion is unlikely to happen frequently. Be it noted, that the displacement observed was primary, taking place at once in the original injury, and of such a kind as could scarcely be produced after lodgment of the head of the humerus in the upper part of the axilla, without injury to the thoracic walls or the shoulder-girdle. While the patient was walking on crutches his right crutch slipped, he lost his footing, and the whole weight of his body being thus thrown on the left crutch, the head of that crutch glided outwards from the axilla, and raised his elbow as he fell to the ground. This is the patient's story. The head of the crutch was the fulcrum on which the dislocation took place; and as it glided outwards it gave more and more leverage to the forces by which the head of the humerus was depressed, viz. the action of the latissimus dorsi and pectoralis major muscles in the commencement of the process, and the weight of the patient's body throughout; but in the ordinary dislocation forwards and downwards the elbow or hand comes into contact with the ground while the head of the humerus is at a higher level, with the weight of the body over it; and the latissimus dorsi and pectoralis major muscles, which are important agents in producing the dislocation, likewise draw the arm and the trunk together, and pull the head of the humerus to the deep part of the armpit. Now, in the present instance, although these muscles doubtless aided in withdrawing the head of the humerus from the glenoid fossa, they were immediately thereafter with great rapidity opposed by the descending weight of the body, which, pressing the acromion against the displaced neck of the humerus, caused the head of the bone to pass between the insertions of the muscles in question, undoing the fold in the tendon of each, and reversing, or more probably destroying, the action of both."

Dislocation of the metacarpus.—In the 'Lancet,' Aug. 22, 1868, p. 245, Mr. Raven, of Canterbury, relates a case of simple dislocation of the second, third, and fourth metacarpal bones from the carpus, uncomplicated by fracture or wound, in a man, æt. 77, who had been kicked by a horse on the left hand. The metacarpo-phalangeal joints on the dorsal aspect of the hand presented a concavity instead of a convexity, owing to the tilting up of the carpal ends of the displaced bones, which projected on the back of the carpus, slightly stretching the integuments. On comparison with the opposite hand, the affected fingers appeared shortened about a quarter of an inch. There was no swelling, so that the outline of the displaced bones could be clearly defined. The dislocation was reduced after some little trouble by extension, combined with a rotatory movement of the metacarpus. There was no sign of fracture. The man was positive that he was kicked on the back of the

hand. There had been, however, also a kick on the chest; and Mr. Raven suspected that the dislocation proceeded from a fall on the hand in consequence of this injury. He states that he has been unable to find any record of a similar injury.

In the third vol. of the 'St. George's Hospital Reports' will be found a paper by Mr. Brodhurst on the reduction of dislocations of old standing, giving the account of the reduction of a dislocation of the wrist of six years' standing, and one of the shoulder seventy-five days after the occurrence of the accident.

Fractures of the lower jaw.—In the 'British Medical Journal,' Feb. 23, March 2 and March 9, 1867, Mr. Berkeley Hill has given an account of the various contrivances recently introduced into practice for the treatment of fracture of the jaw:

"The various positions into which the fragments may fall are—

"1. Simple fracture in the anterior part of the bone with no, or very little, displacement.

"2. Single fracture, with elevation of the posterior part above the level of the other.

"3. The same, with the addition of lateral displacement.

"4. Double fracture, separating both sides from the front of the bone, with backward and downward displacement, and with or without loosening the teeth and comminution of the fragments.

"Any of these may, of course, be complicated with injury to the soft parts.

"The various modes adopted by different surgeons may be collected into four heads:

"1. The external bandage and splint.

"2. Ligature of the teeth, or ligature through the broken ends of the bone itself.

"3. An interdental splint in the mouth and an external apparatus under the chin, between which the jaw is fixed.

"4. An interdental splint fixed to the teeth only."

It is hardly necessary to say much about the first, which is the method in ordinary use for simple fractures near the canine teeth, attended with little or no displacement. Mr. Hill gives some details with regard to the minutiæ of manipulation in making the splint. The three other methods are adapted to more complicated cases. Ligature of the teeth is now generally abandoned as a permanent method of treatment, because, when tight enough to keep the fragments together, the ligature will loosen the teeth. But, as a temporary measure, it is useful while the permanent apparatus is being adjusted. Direct suture of the bone, by passing a wire through each fragment, has been used with success, both in Europe and America.

The third plan is the interdental splint. This can be made on the plan of M. Morel-Lavallée, by laying a piece of softened gutta percha on the teeth (the fragments being brought temporarily together with thread or wire), and attaching this to a horseshoe plate beneath the jaw by means of a hook on either side, which catches the gutta percha, and is provided with a stem to screw into the plate. This splint, how-

ever, though it allows the patient to eat and speak for the time of its application (usually seven or eight weeks), "has its disadvantages. If the fracture take place behind the first molar, the bearing on the upper fragment is too slight to keep it down in its place. Even when this is not the case it is sometimes difficult to press the fragments evenly into the soft gutta percha; and, lastly, if the splint be screwed very tightly together, it causes much pain by squeezing the soft parts of the chin up against the jaw."

Mr. Hill then describes the other apparatus, which seek to effect the same object as M. Morel Lavallée's, but by a more elaborate machinery. Such are Lonsdale's, in which an ivory cap replaces the gutta percha in the dental cap of the one above described, and is also attached to a chin-piece. Mr. Hill describes a modification of this apparatus, made by Mr. Ibbetson in a case under his own care. Mr. Lonsdale's splint is only applicable to cases of fracture between the incisors, as the ivory cap is too short to reach far along the arch of the teeth. It is also very cumbrous. Its advantages are that it permits the patient to eat and speak. Mr. Hill's modification (which consists in the substitution for the ivory cap of a metallic plate made on a mould of the teeth and padded with india rubber to receive the teeth, and some alteration in the mode of attachment to the chin-piece) enables the apparatus to be used in fracture farther back. Another contrivance is that of Mr. H. Hayward, who adapts a silver plate to the whole of the lower jaw (on a mould obtained, if necessary, under chloroform, while the fragments are kept temporarily in apposition), and attached by wings, or arms, of silver to an external splint; gold answers even better than silver. Finally, Mr. Hill calls attention to the plan of Mr. Gunning, of New York, who adapts a splint of vulcanite to the teeth, which has been struck upon a model of the jaw, and extends beyond the margin of the gums on all sides. In simple cases the perfect fit of this splint ensures its keeping the parts in apposition, while the movements of eating, &c., are but little interfered with. Holes should be cut through the vulcanite to permit a stream of water to be injected, so as to clean the mouth, and in difficult cases a hole should be made opposite a tooth on either side of the fracture for ascertaining from time to time that each part continues in position. But in more complicated cases (as when teeth are lost on either side of the fracture) more special contrivances are necessary. When this is the case Mr. Gunning screws the splint by small gold screws into the sound teeth on either side of the jaw. The screw-holes can be filled up after the splint has served its purpose. In still more complicated cases, as where there is much vertical displacement, the splint is to be attached also to the upper jaw by a mould of its teeth, a hole being cut below for passing food into the mouth; and if there is much comminution Mr. Gunning also attaches the interdental splint to an external support under the chin, and, if necessary, to a cap on the head also. Mr. Gunning's original paper will be found in the 'New York Med. Journ.,' Sept. 1866. The well-known case of Mr. Seward, who was under Mr. Gunning's care, is referred to. The advantages of Mr. Gunning's interdental splint are thus stated:

"1. It ensures complete immobility of the fragments more certainly than any other plan.

"2. Consequently, it relieves the patient of much pain during its treatment.

"3. As it presses on none of the soft parts, it fits tightly from first to last, and avoids the discomfort accompanying the chin-splints.

"4. It, in all but the worst cases, is no greater hindrance to the patient in pursuing his daily occupation than a set of false teeth. It allows him to eat, speak, and go about unnoticed."

Fracture of the neck of the scapula.—In the 'Deutsche Klinik,' 1867, pp. 420, 428, 438, Dr. Lotzbeck, of Munich, treats of fracture of the neck of the scapula, In the first place, he distinguishes the "anatomical neck," or the contracted part of the bone immediately surrounding the glenoid cavity, from the part which is ordinarily intended when the neck of the scapula is spoken of, and which he calls its "surgical neck." In proof that fracture may traverse at least a great part of the anatomical neck, he refers to the case recorded by Spence and Steel, in the 'Edinb. Med. Journ.,' 1863, p. 1083, in which "all the articular portion was severed from the rest of the scapula and displaced downwards;" to a case mentioned cursorily by Petit ('Maladies des Os,' 1735, p. 136); and to one which he met with in his own practice. On the strength of these cases he admits that fracture of the anatomical neck, *i. e.* fracture on the outer side of the coracoid process, does occur, though the more common fracture is in the surgical neck, *i. e.* on the inner side of that process. After some references to the authors who have expressed divergent opinions, and given statistics on the subject of these fractures, Dr. Lotzbeck relates two cases which have occurred in his own practice. In the first of these the symptoms at first sight much resembled dislocation; the arm was lengthened by one inch, directed away from the side, and the acromion prominent; but the injury was easily distinguished from dislocation by the fact that the coracoid process was also displaced, and moved with the arm in passive motion; that such movements were perfectly easy to produce (though very painful), the length of the arm was at once restored and crepitus obtained; and finally, that an irregular fragment of bone could easily be felt in the axilla. After about nine weeks' treatment the patient was cured, and ultimately regained almost complete motion. In the other case the diagnostic signs from dislocation were somewhat the same, viz. the ease with which the difference in length (somewhat less in this case, about $\frac{2}{3}$ in.) could be remedied—the production of crepitus when this was done—the freedom of passive motion, though with much pain, and the sensation of a bony fragment in the axilla. But since, in this case, the coracoid process remained in its place, and did not move when the arm was acted upon, Dr. Lotzbeck classes this as a fracture of the anatomical neck. In this case, also, the motion of the joint was, as it appears, fully restored.

He concludes with a careful *résumé* of what is known as to this injury. In regard of the symptoms of fracture of the neck of the scapula, he says that the flattening of the shoulder is due to displacement of the

fractured portion inwards, caused by the fragment following the arm, and being drawn into the axilla partly by the force which produced the injury, partly by the traction of the flap of the axilla. There is always an increase in the length of the injured arm. The fragment, of varying shape, may be felt in the axilla, and sometimes the contour of the head of the humerus may be perceived, but not so plainly as in dislocation. The symptoms of pressure on the brachial plexus, so common in the dislocation, are never present in the fracture. The direction of the arm is always away from the side, and from below upwards and forwards, so that a line drawn upwards from the external condyle of the humerus parallel to the axis of the arm will fall internal to the shoulder-joint. Crepitation is present, and has been described in all the recorded cases except one, and in one case an abnormal mobility of the scapula itself, with no effect on the shoulder, was perceived. There is usually, but not always, great swelling and contusion, and often other severe injuries, since the force required to produce the fracture is usually great. Active motion is generally quite abolished; but passive motions, on the contrary, are free, though painful, constituting (under chloroform, if necessary) a valuable diagnostic mark. Reduction is easy in the fracture, but the deformity recurs when the force is removed. By these signs the fracture can be easily distinguished from the subglenoid dislocation. It is also to be diagnosed from dislocation complicated with fracture of the neck of the humerus, or from the latter injury alone, or separation of its epiphysis. In the first injury the dislocation will be under the pectoral muscle, and accompanied, therefore, by shortening; the uncomplicated fractures of the humerus want the flattening of the shoulder and the lengthening of the arm which accompany the injury in question.

By appropriate treatment the fracture unites in about 5—7 weeks kindly, and with very good use of the arm. The prognosis, therefore, is very favorable. He recommends that the parts be carefully kept in position while the fracture is being put up, since the deformity is very easily reproduced—that a cushion be placed in the axilla, and a pasteboard splint with starch bandage made to embrace the shoulder, arm, and forearm, the hand being raised and applied against the thorax. He regards ligamentous union as being very improbable if the injury is properly treated.

In the 'Deutsche Klinik,' 1867, p. 448, a case is recorded under the care of Prof. Volkmann, of Halle, in which after a fall on the knee a portion of the articular surface of the femur was extracted from the joint with the usual symptoms of a "loose cartilage." The patient, a lad, æt. 19½, who had never had anything the matter with the knee before, had experienced a heavy fall on it, with the limb in acute flexion; this was accompanied by a sharp pain and a sense of cracking in the joint. He managed to walk home with assistance, though with great pain and difficulty. There was no contusion about the knee, and he seemed to have fallen rather upon the foot in a sitting posture than on the knee itself. The accident was followed by considerable effusion of fluid into the joint, which was believed to be blood, and on the day

succeeding the injury the patient detected a hard, movable, rather large, round flat body in the joint, which he could move hither and thither. He called the attention of his medical attendant to it, who immediately pronounced it a "loose cartilage." He remained in bed about seven weeks, undergoing the usual treatment for the removal of the fluid from the joint, but without much result. Then he was allowed to get about, which he managed to do, though only limping. When the loose body was in the external part of the joint it caused little inconvenience, but when it got inside the patella the patient suffered great pain, and could not put his foot to the ground. He was admitted into hospital three months after the accident. The joint was then slightly inflamed, but by complete rest and bandaging this subsided in about six weeks, and then the foreign body was extracted by an incision about two thirds of an inch long, made directly down to it, the skin having been previously displaced, so that the skin wound should not afterwards coincide with that into the capsule of the joint. A few drops of synovia escaped. The limb was immediately put up in a plaster of Paris splint. He recovered without any bad symptoms, and was discharged sixteen days after the operation. He could then walk without limping, but bent the knee carefully, and avoided extreme flexion. Flexion was only possible as far as a right angle, and was accompanied by a peculiar dull crepitus, particularly plainly felt when the hand was applied to the back of the femur. The sensation was as of a hard and rather smooth body gliding off another. The body removed from the joint presented a slightly convex and perfectly smooth cartilaginous surface above, and a rough but almost perfectly flat bony plate below. It was almost exactly circular, except a sharp process sticking out of one side of it, and it measured about 19 mm. in diameter. It was perfectly clear that it was a broken portion of the femur, since the cartilaginous surface was perfectly smooth, while the bone presented the sharp edges and open cancelli of a fracture. On comparing it carefully with the bones of individuals of about the same size, Prof. Volkmann satisfied himself, by the radius of the curve and the form of the surface, that it was a portion of the inner condyle. Microscopical examination confirmed the conclusion that it was a portion knocked off the healthy femur. The fracture is attributed to sudden flexion and adduction of the joint (from falling in a sitting posture on the heel), driving the tibia forcibly against the convexity of the inner condyle.

A case of injury to the chest, with fracture of several ribs, in which a fragment of necrosed rib was found encapsuled in the lung three years after the receipt of the injury, is related by Mr. Bruce in the 'Path. Soc. Trans.,' xviii, 33.

Osteo-aneurism.—In the 'Pathol. Soc. Trans.,' xix, 349, is an account by Mr. Bickersteth of a case of tumour of the tibia, believed to be aneurismal, for which amputation was performed. There were no appearances of cancer, and Messrs. Adams and Bryant, who report on the specimen, also look on it as aneurismal merely; but the operation

had been performed too recently (Dec. 1867) to justify the conclusion that recovery was permanent, and no return to be apprehended.

On "ulcerating dermo-synovitis in the seat of a corn on the sole of the foot," called "mal plantaire perforant."—In the 'Gaz. des Hôp.,' 1867, p. 369, will be found a clinical lecture by M. Gosselin on this subject, to which he thinks justice has hardly been done in previous works. His own description is as follows:—The first phase of this affection consists in inflammation between the derma and epidermis; the derma is thickened, and there exists sometimes a little sero-sanguineous fluid between it and the epidermis. Then inflammation attacks the (natural or accidentally) bursa mucosa lying below, which becomes enlarged and suppurates, leaving a fistulous opening. This is the second phase. If the patient is not looked after, and continues to walk, the inflammation becomes ulcerative as well as suppurating; a part of the corn ulcerates, and underneath it the synovial membrane of the bursa becomes thickened, fungous, and partly destroyed. Then, if the complaint is still neglected, inflammation spreads to the deeper parts, it passes to the periosteum and to the articular synovial membrane, so that the ulceration attacks sometimes the phalanx, sometimes the synovial membrane of the metatarso-phalangeal joint, according to the position of the corn. Such are the anatomical characters of the disease; its clinical characters are as follows:—(1) The persistence and gradual march of the disease as long as the patient does not take rest in the horizontal position. (2) The absence of pain, except in inflammatory exacerbations. (3) The rapid cure both of the disease and of the inflammatory exacerbations by simple rest in the horizontal position and careful cleanliness, even if a phalanx be denuded or the joint be involved, provided it is not too far disorganized. (4) Lastly, the quick recurrence of the disease if the patient exposes himself anew to the causes that produced it originally. M. Gosselin observes that the corn, if it is the most striking cause of the disease, is not its only one. There is, in the first place, that which caused the corn itself, viz. the persistent and habitual maintenance of the erect posture. And this acts with more force upon large and heavy persons. Thus, M. Gosselin has remarked that most of the patients have been powerful men. The influence of this cause is further increased upon men whose calling compels them to carry heavy weights. MM. Péan and Morel-Lavallée has spoken of degeneration of the arteries as acting as a cause, but M. Gosselin thinks that the curability of this ulceration in the horizontal posture is hardly reconcilable with this idea. He has traced no constitutional causes. Of general causes he has no doubt that indulgence in alcohol habitually to an excess is one, age is another. The affection is hardly met with before the age of 45 or 50. The prognosis is so far good that with care and rest a cure can almost always be obtained, unless the ulceration has deeply affected the bone, when it may be retarded by necrosis. But if the patient will not avoid prolonged work on his feet and indulgence in alcohol, (and in most cases his necessities or his tastes will not permit him to do so,) relapse will quickly ensue.

In the 'Lancet' for Oct. 12, Oct. 19, and Dec. 7, 1867, Mr. Barwell

gives a new theory of the "Natural History of Lateral Curvature of the Spine," with suggestions for its treatment. The facts, according to Mr. Barwell, for which a complete theory ought to account, are "the occurrence of rotation in lateral deviation of the vertebræ, the predilection of this condition to girls and young women, and its prevalence on the right side." The received theories do not furnish any such explanation. Muscular weakness is not always present, "but the distortion often occurs in very strong, even powerfully built, young women: and such weakness, with weight of the head, &c., would cause posterior, not lateral, deviation, while osseous or cartilaginous disease would not so constantly affect one and the same side.

Mr. Barwell commences by observing on the straightness of the spine and the horizontal position of the pelvis in infancy. The change to the adult form is due, according to him, to muscular force:

"When the child begins to walk, a change takes place in all these postures. The thighs must take a new position, and lie in a line parallel with the body's axis. In doing this they drag on all the muscles passing from the anterior part of the os innominatum to the femur, on the iliacus, rectus, pectineus, and others; the pelvis, yielding to these forces, must necessarily receive a downward slope, and the sacrum must project backwards. The psoas, made tense by the same force, draws the loins forward, while the mass of lumbar muscles enforces that bend of the lumbar region necessary to compensate for the pelvic obliquity, and to preserve the body in equilibrio. It seems at first sight well to say that the dorsal bend is produced by the necessity of balance; but it will on consideration be seen that there must be muscular force to place the passive bones in the position which permits balance. This force is supplied by the abdominal muscles which pass from the pelvis to the walls of the chest, especially the external oblique and the rectus, the ribs acting as levers to transfer the power to the vertebræ.

"The flexion backwards of the cervical spine, also necessary for balance, is produced by the tension, employed for keeping the head erect, of those muscles which are attached to the occiput, as well as of those attached to the vertebræ themselves. I must here make an observation on the position of the head in man, and the small size of the ligamentum nuchæ, which is especially placed in animals to economise muscular power. Although the weight of the head is in man considerably forward, yet very little muscular power is required to keep it upright. The disposition of the upper part of the trapezius muscle, running from occiput to acromion, is such that a small part of the weight of the shoulders is quite sufficient to counterbalance the forward tendency of the head without fatiguing the muscle, since no contraction, further than mere tonic tension, is necessary to permit the weight of the one part to act on the gravity of the other.

"Thus the normal antero-posterior bends of the column are superinduced upon the previously straight spine simply by muscular force."

In order to determine the influence which such muscular force would exert, Mr. Barwell found it necessary, in the first place, to measure the degree of mobility which various parts of the spine possess naturally.

He describes the method which he adopted, and which may shortly be stated as being, for the rotation-movements, to fix a rod and dial-plate to the upper part of the chest, the pelvis being fixed and the knees kept firm by grasping a pillar; and for the lateral curve of the spine, to photograph patients while bending their bodies sideways as far as they could without strain. In this way Mr. Barwell convinced himself that rotation is pretty equally distributed over the whole spinal column, each of the sixteen bones of the dorsal and lumbar spine (the last lumbar vertebra having, probably, no power of rotation), revolving upon the other about 7° 75′ in ordinary cases, and that the dorsal and lumbar spine can, in ordinary individuals and without exertion, bend laterally in a curve whose radial distance is eight ninths of its own length, assuming it to be circular. This curve, however, is not in reality truly circular; the greatest amount of bend takes place between the seventh and tenth dorsal vertebræ. With respect to the condition of the spine in other ordinary actions, Mr. Barwell gives the following as the result of his experiments:—"In walking, sitting down, and rising again, and lifting even small weights, the spine bends from side to side. As might be expected, motions of the arms and shoulders influence chiefly the upper part; movements of the lower limbs, especially if the pelvis itself move, chiefly the lower part, of the spine. The former movements only affect the spine when either powerful or prolonged; for instance, a pound weight may be held in the hand outstretched without influencing the spine for a certain time, but when fatigue commences the column bends; a greater weight will at the moment of lifting cause bending of the column, produced in both instances by the spinal muscles which lie at the opposite side to that which carries the weight. Any movement which shifts the weight of the body from one leg to the other causes lateral flexion of the lumbar and lower dorsal spine; for instance, walking, especially ascending a staircase, causes deviation to the right and left, in some persons as high as the seventh dorsal, in others only to the tenth dorsal vertebra. With every lateral movement a commensurate amount of rotation is combined; it does not appear possible to bend the spine sideways without at the same time rotating the vertebræ to a certain extent."

Mr. Barwell earnestly condemns the application of cumbrous rigid machinery to the spine, as being always inefficient (since the *point d'appui* on which the machine relies for its action is never sufficiently steady), and liable to cause distress and deterioration of the general health.

Arguing from this great freedom both of rotation and of lateral motion in every part of the dorso-lumbar spine, Mr. Barwell proceeded to inquire what muscles could produce the amount of rotation indicated by the machine which he employed, "for it appeared to him that the spinal muscles proper in the dorsal portion of the column are not so placed as to produce this effect. Somewhat unexpectedly, he found that rotation of the vertebræ in all the upper part of the column is effected by the serratus magnus, which when thin persons are under observation stands out during such action strongly and sharply." He conceives that the serratus magnus is continued on to the spine by the rhomboidei muscles, the intervening base of the scapula being, as it were,

merely "an intersection, like the semilunar lines in the abdominal rectus." We continue in Mr. Barwell's own words:

"This muscular arrangement acts at great advantage in turning the upper part of the body on the pelvis; its base of attachment to the spine is small, its leverage short, that to the chest very large, and in contracting it draws the ribs of that side backwards. Each rib having attachment to the body, and also to the transverse process of the vertebræ, becomes thus a lever of the second class, whose power arm is the length from the muscular attachment to its head, whose weight arm is the distance from head to tubercle; it is, indeed, a crow-bar very powerful to twist each vertebra on its own axis. This function of the rib is attested by the fact that when the serratus ceases to be inserted, the spinal attachment of the rib no longer affords a purchase for such action. In losing the double conjunction to body and transverse process, the lower ribs abrogate the arrangement of fulcrum and weight necessary to lever-like action on the vertebræ, and at the same time the serratus ceases to be attached to the ribs.

"Now let us consider the action of the serratus under another point of view. It was said in a former paper that only a small portion of the weight of the shoulder was supported by the upper fibres of the trapezius, otherwise its action on the head would have to be counteracted by other muscles, which would greatly interfere with the freedom and mobility of the head and neck. Therefore the upper angle of the scapula hangs to the spine by its levator muscle; but the outer angle, the shoulder-joint and the arm, is supported by the serratus, which, drawing the base and lower angle of the shoulder outwards and forwards, keeps the outer (acromion and shoulder) upwards and backwards. The weight, therefore, of the shoulders and of the arms falls, through the medium of the serrati, upon the ribs, and this weight tends to keep them back—equally, of course, on both sides of the chest if the arms be of equal weight.

"The most important function, however, of the serrati is respiratory; they lift and draw back the ribs on each side of the chest as far as the freedom at the joints permits, thus enlarging the cavity of the thorax. In forced inspiration this action is very marked; but man during quiet breathing hardly uses the muscle at all, his respiration being chiefly abdominal; woman's ordinary quiet breathing is, on the other hand, very much more pectoral, her chest and bosom rising constantly with each inspiration, even during sleep. In woman, then, more than in man, the ribs are drawn backwards in inspiration—an action which would be equal on both sides of the chest if both lungs admitted the same quantity of air.

"The hypothetical sentences at the end of the last two paragraphs are of importance. The arms are not of equal weight, nor are the lungs of the same size. A boy or youth, however, uses free exercise, swings his arms as he walks, and lolls and lounges about in all conceivable positions, thus giving variety to the manner in which the shoulders are supported; and, above all, he breathes chiefly by the diaphragm. The girl or young woman takes less free exercise; in walking she lets the arm hang almost motionless from the shoulder, sits decorously upright, so

that the weight of the arms hangs all day long, through the medium of the serratus magnus, on the ribs; and, far more important, her breathing is chiefly pectoral. Now, let the ribs be regarded, in the manner above described, as powerful levers, which, under the sway of the serratus, can rotate the spine should the one muscle act more powerfully than its fellow; and consider the girl thus circumstanced, with the right arm heavier than the left, with the right lung more capacious than the left, and it will be seen that the serratus of the right side, being more weighted and in stronger respiratory action than its opponent, must of necessity rotate the vertebræ to the left side. This explanation will at once account for the rotation of vertebræ, and its prevalent direction. Moreover, a crucial proof, if I may use such a term, is found in the fact that European women, who, by tight clothing round the waist and abdomen increase their tendency to pectoral respiration, are the frequent subjects of lateral curvature; while among Hindoos, Arabs, and others who use a loose form of dress, such deformity is all but unknown.

"Again, when part of one lung becomes from some local disease unfit for its function, the ribs covering that portion cease to move, and are uninfluenced by that particular serration of the muscle. Therefore the corresponding ribs of the sound side bulge backwards, and the cognate vertebræ become crooked. This is not produced by contraction of the lung on the diseased side (there is frequently rather swelling than decrease in bulk), but from inaction of the serratus over the affected spot; the opposite parts of the muscle, therefore, on the sound side must twist the vertebræ, since their action is unbalanced on the morbid side of the chest. So accurate is this correspondence that we may fix upon the part of lung most affected, by noting the ribs which protrude on the sound side, and the locality of the spinal deviation. In curvature from consumption we find nearly always a high short dorsal curve, as in a patient recently sent to me by Dr. Cotton; in pneumonia the curve is low and long, as I have had more than once occasion to remark in cases at the Charing Cross Hospital.*

"It will, of course, be remarked that in this explanation I entirely change the sequence of causality. It is usually stated that the spine first curves laterally, then rotates, and in this latter movement, by dragging with it the ribs, deforms the chest. I affirm that the ribs are primarily drawn backwards, and, acting as levers, twist the vertebræ, which in consequence deviate from the right line; according to a simple mechanical law, and yielding to the new direction in which the erectors of the spine now act; for in this rotated condition straightening the spine curves it naturally to the right, and in lateral curvature much of the sideways distortion is in reality extension.

"In this etiology the different weight of the two arms is not nearly of so much importance as the peculiarities of the respiratory function;

* "By no other method can we account for the fact that in pleurisy, when the size of the contents on one side of the chest is increased, and afterwards, when, the lung being bound down by adhesions, their size is diminished, we still have curvature in the same direction—*i. e.* from the diseased side; the ribs on that side ceasing to move on respiration."

yet even in the male subject the spine is twisted slightly to the right, so frequently that such condition is by some regarded as normal. A man, after the amputation of one arm, acquires by the action of unequal weight a certain amount of lateral twist, rarely sufficient to constitute a noticeable deformity. When, however, a girl carries a weight constantly on one arm its power in contorting the spine becomes considerable, and we occasionally find nurse-girls become very crooked from such cause. In these cases the lumbar muscles on the other (the left) side of the spine are found very much developed in consequence of increased action counterbalancing the burden carried. In such cases the compensatory lumbar curve is established simply for the sake of balance; not so the secondary curve in cases arising from respiratory causes. The two forms are distinct, not only in causation, but in form, and in the action of subtending muscles. How and why these differences arise must be the subject of another paper.

"If the two causes (one-sided pectoral breathing and the influence of weight) be combined, as is frequently the case, their distorting power is very great; but the former is undoubtedly the more influential, and is continuous both night and day. European women, as above stated, increase this peculiarity of thoracic breathing by wearing tight petticoat strings, corsets, and belts round the waist; also many plump girls, in desire to retrain any unsightly, however blameless, enlargement of the abdomen, frequently compress that part with belts or corsets, and thus by almost entirely checking the respiratory movements of the abdomen place themselves in a position of dangerous facility for acquiring dorsal curvature."

Mr. Barwell next goes on to show in what way the abdominal muscles passing from the ilium to the ribs, and meeting there with the insertions of the serratus magnus into those bones, act in the production of spinal curvature from respiratory causes, the line of force thus exerted upon the ribs and through the ribs upon the vertebræ lying, according to him, in the diagonals between the lines of action of the serratus and external oblique, which he finds by experiment to converge to a space between the first and third lumbar vertebræ.

The cause of curvatures primarily lumbar Mr. Barwell places in the action of the quadratus lumborum and psoas muscles (chiefly the latter). This is caused by various deformities, as ankylosis of the knee, contracted hip, varus, or by bad habits of position, causing protrusion of one hip, which is the first symptom of the deformity generally noticed by ordinary observers, as the dressmaker or dancing-master.

Mr. Barwell then passes on to consider the curability of the complaint. He asserts that lateral curvature is never caused by a yielding of the substance of the vertebræ themselves, but only by compression of the intervertebral substance; and he cites an experiment of Hirschfeld's, which he has himself twice repeated at the ages of 43 and 34, and which proves that in the denuded vertebral column, if all the pedicles be cut off, so as to isolate the column formed by the bodies, the latter will immediately become quite straight, in consequence of the resilience of the intervertebral discs. This shows that even a very long persistence of

compression will not prevent the intervertebral discs from recovering themselves, if only the compressing force be antagonised.

The plan of treatment which Mr. Barwell recommends in lumbar curvature is to commence by remedying the faulty relations between the pelvis and thighs, in which he believes it to have its origin. This he effects by making the patient sit for some hours a day on a sloping seat, raised towards the side to which the hip projects. The degree of slope must be carefully regulated, as too great elevation does harm by exhausting the muscles which are to be called into action. This position may also be supplemented by applying a high sole to the boot on the convex side of the lumbar curve. In cases where the prominence of the soft parts covering the convex side of the lumbar curve is well marked, a bandage is to be applied after a fashion described in the paper, consisting of a broad belt or band round the flank on the convex side, supported by a pad or girth round the opposite hip, and, if necessary, the shoulder also. The object of this appears to be to check the tendency to any further leaning towards the outgrowing side, and to give support without weight or cumbrousness. To these curative measures Mr. Barwell adds calisthenic exercises, the most advantageous of which are described as follows:

"Let the lumbar curve be to the right; the patient, with both knees perfectly straight, stands on a block or book from one to three inches high, as the case may demand, and with the right foot so close to the edge of the block that, by just separating the limbs, that extremity passes over the border. Still keeping the knees quite straight, the right foot is by action at the hips made to sink till its sole rests fairly on the ground for a minute, both knees being kept straight; then it is replaced on the book, and this manœuvre is repeated for a prescribed time, and at a certain rate. A chair is placed against the wall, the patient, standing sideways to the wall, balances herself with the left hand upon it, and, planting the left foot on the chair, slowly lifts herself until she stands upright. Standing with her back to the wall, the patient slowly lifts the left knee forward till the thigh is at right angles to the body, and gradually lets the limb fall again, repeating this movement slowly and rhythmically. After a time the foot is to be weighted according to the strength of the patient.

"An exercise very valuable in long-standing and severe cases, for stretching ligaments on the concave side of the spine, is the following:—The patient stands with the back to the wall, and, if possible, with the left side against the corner wall, or some straight piece of furniture, as a piano or bookcase, so that she may be sure of not deviating from the perpendicular to that side. A block, of carefully proportioned thickness, is placed under the right foot. Fixing the right arm akimbo, she quickly and forcibly (according to her strength) bends the upper part of the body sideways to the right, and repeats this several times. The back must be kept against the wall, the knees kept rigidly straight, and if the limbs be rather weak, or the patient awkward, a napkin or round towel passed round the hips, and secured to the wall on her left, must uphold the due position of the pelvis.

"These are the more important among the exercises which I employ.

They are to be used with great caution, and from time to time the surgeon must watch them, lest any awkward trick in their performance render them useless or injurious."

The diagnosis between curvature primarily dorsal and that primarily lumbar depends, according to Mr. Barwell, on the relative projection of the thorax and pelvis, the former being the essential characteristic of the primarily dorsal as the latter is of the primarily lumbar curvature.

The treatment of the primary dorsal curve is not described in this series of papers.

The second series of lectures on the anatomy and surgery of the human foot by Mr. Hancock, late Professor of Anatomy and Surgery at the Royal College of Surgeons, will be found in the 'Lancet' for June 6, 1867, and numerous subsequent numbers. We offer the following abstract. The first lecture refers to excision of the ankle-joint. Mr. Hey, of Leeds, is said to have performed, in 1766, the first authentic resection of the lower ends of the tibia and fibula for compound dislocation—an operation which is attributed to Hippocrates; and in 1792 Moreau performed the first excision of the ankle for disease. The operation succeeded, and was followed by a few other recorded cases in France. Mr. Hancock claims for himself the first operation for "excision of the ankle" in the strict sense of the term, though he allows that, if in that term be included the removal of portions of the foot, whether including the joint or not, Liston, Wakley, Teale, and others, have preceded him.

After a brief sketch of the partial excisions of the foot, performed in 1847 and 1850 by Mr. Thomas Wakley, Mr. Hancock describes the original operation, in which he excised the ankle-joint, and which was performed in Feb. 1851, as follows:

"I commenced the operation with an incision behind, and about two inches above the external malleolus, carrying it forwards beneath that process across the front of the joint, and terminating about two inches above and behind the inner malleolus. This incision included the skin alone, without implicating the tendons or their sheaths. The flap thus formed was dissected up, and the peronei tendons were detached from the groove behind the fibula and cut through, as were the external lateral ligaments close to the fibula, with a pair of bone-nippers. I next divided the fibula about an inch and a half above its inferior extremity, and, cutting through the inferior tibio-fibular ligaments, detached the external malleolus. Now turning the leg on to its outer side, I cut through the internal lateral ligament, carefully keeping my knife close to the end of the tibia, to avoid the posterior tibial artery. The tendons of the tibialus posticus and flexor communis were then detached from the groove behind the internal malleolus, and taking the foot in my two hands, the late Mr. Avery, who assisted me, holding the leg, I next dislocated the foot outwards, thus bringing the end of the tibia with the internal malleolus prominently through the wound. These were removed by the common amputating-saw, applied half an inch above the horizontal articulating surface of the tibia, the soft parts

being protected by a spatula; and the upper articulating surface of the astragalus having also been removed by a metacarpal saw held horizontally. The foot was then restored to its proper position, the cut surface of the astragalus being adapted to the cut surface of the tibia, and the wound having been closed by sutures, except on the outside, which was left open for the free escape of discharge, the leg was placed on its outside on a splint, having an opening corresponding to the wound, and the patient was returned to his bed.

"You will, doubtless, have observed that the parts here cut through were the skin, the peronei tendons, the internal and external lateral and the inferior tibio-fibular ligaments, and the lower ends of the tibia and fibula. In subsequent operations I preserved the tendons entire. In no instance have the anterior or posterior tibial arteries been wounded, and in no instance has it been necessary to apply a single ligature."

Mr. Hancock then proceeds to observe upon the difference between this operation and the partial excisions of the foot which have been confounded with it, and observes that, though adopted by some surgeons of reputation, the operation has not met with so much general approval as he thinks it deserves.

Mr. Hancock has performed the operation five times, in four with success, the fifth patient dying of lung-disease, "the result of a life of dissipation." Mr. Hancock proceeds to point out that no sloughing need follow the operation, nor need any tendon or vessel be divided; and he relates and comments on cases and statements unfavorable to the operation adduced by Dr. Humphry, Mr. Furneaux Jordan, and Mr. Hussey, the inconclusive nature of which he endeavours to demonstrate; and he also points out that the difficulty of determining, prior to operation, whether the disease is limited to the joint or no, is no objection to the operation, since if the disease is too extensive to be removed by excision, the incisions can be at once used for a Syme's or Pirogoff's amputation. To these opinions adverse to excision Mr. Hancock contrasts, in his second lecture (ibid., July 20, 1867) the favorable opinions expressed by Guthrie and by Mr. H. Smith, a very striking case operated on by Dr. Canniff, Professor of Surgery at Toronto, in which the whole astragalus, half an inch in thickness of the os calcis, and about one and a half inch of the tibia and fibula (in all more than three inches of bone) were successfully removed, and then gives a short account of his own cases. He concludes this part of the subject with the following statistical summary:

"I find that the ankle-joint has been excised 32 times for disease by British surgeons.

"That the ages of the patients operated upon varied from 4 to 42 years.

"That the sexes given show the proportion of 16 males to 6 females.

"That of the 32 patients operated upon, 21 recovered with good useful limbs, 7 died, 2 suffered secondary amputation and recovered, whilst the result of 2 was doubtful.

"The proportion of deaths, consequently, is a fraction above 21 per cent., a large proportion, I must admit, when compared with that of Syme's amputation. But it is not in reality so great when we inquire

more closely into the matter; for instance, of the 7 deaths, 4 are reported to have died of consumption, of which disease 1 is stated to have been suffering at the time of operation, another died of the effects of syphilitic poison in the system. We can scarcely, therefore, attribute the deaths of these four consumptive patients exclusively to this operation; consequently, if we make allowance for them, we find the death-rate of average cases 10 instead of 21 per cent., whilst the mortality of amputation of the leg for disease in civil surgery is 26 per cent."

Mr. Hancock then describes the various operations by which the ankle may be removed, insists upon the importance of detecting any syphilitic taint in the patient (instancing cases in which such a taint has existed, and some in which it led to the failure of excision), on the great advantage of ensuring a very free exit of matter, and upon the superiority of total over partial excision. He adduces, however, an instance of the success of partial excision in a patient under Mr. J. Wood's care, at King's College Hospital.

In the remainder of this lecture Mr. Hancock speaks of compound dislocation of the ankle, the treatment of which he believes to comprise "some of the most brilliant achievements of modern surgery; indeed, it would almost appear that the more alarming and extensive the laceration, the greater the chance of a cure and the more happy the result." He then goes on to quote numerous cases of successful excision of the ends of the bones of the leg in compound dislocation, and terminates his lecture in these terms:

"Notwithstanding the statement by Mr. Syme, reported in the tenth volume of 'Braithwaite's Retrospect,' 'that in the Royal Infirmary of Edinburgh he finds that of 13 patients who had suffered compound dislocation of the ankle, and were not subjected to amputation, only 2 recovered, and that even in the event of recovery the foot generally remains in such a state of stiffness, weakness, and sensibility to external impressions, as to render it an incumbrance rather than a support to the patient'—I say, notwithstanding these adverse comments, the results here detailed fully prove the value of the proceeding, and seem to me fully to warrant its extension to those complicated cases of fracture and dislocation of the ankle-joint without wounds of the skin, where the difficulty, and in some instances the impossibility, of restoring the parts to their normal position, has been productive of so much suffering and such bad results to the patient, since they show the comparative impunity with which the ankle-joint, complicated as it is, may be laid open so long as the opening is large and direct, and the confinement of discharge and consequent constitutional disturbance carefully guarded against."

In his third lecture Mr. Hancock speaks of Syme's amputation, instancing at first some cases in which this operation has been necessitated by "progressive caries," or chronic withering of the foot, which commences in an ulcerating corn in the sole of the foot, gradually invading all the metatarsal bones and phalanges." This is apparently the "mal perforant du pied" of French surgeons.

He then speaks of Chopart's operation, and defends the claims of that surgeon (questioned by Velpeau) to the merit of having originated

the operation. Still, according to Mr. Hancock, Chopart did not describe the proper anatomical points by which the amputation is facilitated, so that in his hands it was a difficult proceeding, but was rendered easy by Richerand and Bichat, who pointed out the value of the tuberosity of the scaphoid bone as a guide.

"A great desideratum to the surgeon is to be able to enter the articulation readily, and for this purpose the directions laid down by Chelius appear to me to be ample. 'The operator,' he says, 'places the *tip* of his forefinger *on* the prominence or tuberosity of the scaphoid, and the flat of his thumb *behind* the prominence of the fifth metatarsal bone. A line drawn across the dorsum of the foot *behind* the finger and thumb indicates the joint.'"

Mr. Hancock then dwells on the difference in opinion between good surgeons as to the treatment of the exposed ends of the os calcis and astragalus—some preferring to leave their cartilaginous ends exposed, others to saw them off, to which latter opinion Mr. Hancock himself seems to incline.

In his third lecture Mr. Hancock combats the objection which Mr. Syme has raised against Chopart's amputation, as being very liable to be followed by secondary amputation above the ankle. This, he says, is not supported by the statistics of the operation, for out of 104 cases, exclusive of those mentioned by Mr. Syme, only 2 were followed by secondary amputation, and that not for recurring disease, but for retraction of the heel and painful cicatrix. He gives examples from several authorities of the occurrence of these causes of failure after Chopart's amputation, and he relates the following instance in which the parts were dissected after the operation:

"In 1843 Dr. Stanski amputated a leg upon which Chopart's operation had been performed in 1839. The patient, not being able to walk, had in 1842 undergone division of the tendo Achillis and the removal of a portion of the os calcis without deriving any benefit. Upon dissection he found that the tendons of the back of the leg, viz. the tibialis posticus, the long flexor of the great toe, and the flexor communis digitorum, were firmly attached to the anterior portion of the inferior surface of the os calcis. The tendons of the two peronei muscles were also attached to this bone; so that the pulleys around which they play being posterior to their insertions, their contractions caused the os calcis and astragalus to be pointed downwards, as in extension. The tendons of the tibialis anticus and the extensor communis were inserted on the skin, and their insertion consequently being movable, these muscles exerted no influence over the bones, and the long extensor of the great toe, inserted into the posterior border of the anterior facet of the astragalus, was the only muscle to cause anything like flexion. Nearly all the os calcis in front of the superior articulation had been removed; but the greater part remained as well as the astragalus, which was carious. Both the bones were drawn so much backwards and upwards that the os calcis posteriorly touched the posterior border of the articular surface of the tibia. The os calcis was likewise strongly fixed in extension by the posterior fibres of the lateral ligaments, especially by those of the external, which formed a strong solid cord. The astra-

galus was luxated forwards, and was almost completely out of the tibio-fibular mortice, so that its anterior articular surface looked downwards. After relaxing the whole of the posterior tendons, it was impossible to replace the astragalus, or to bring the calcis forwards, the latter being so firmly fixed by the external lateral ligament."

Mr. Hancock proceeds thus:

"It appears to me that sufficient distinction has not been made between retraction of the heel and the painful cicatrix. They have been too much mixed up together, and the painful cicatrix regarded as dependent on the retraction of the heel and the consequent pressure upon the face of the stump. They should rather be considered as distinct, the one arising from muscular contraction, the other from insufficiency of flap and adhesion of the attenuated cicatrix to the bone. True, such a cicatrix is intolerant of pressure and liable to ulcerate, and the ulceration so produced is liable to extend to the bone beneath; but the contraction of the heel does not produce the painful and adherent cicatrix, any more than the painful cicatrix produces the retracted heel, and there is no reason why a well-formed stump, amply covered by non-adherent and movable soft parts, should not in this operation bear pressure as well as the stump made in any other amputation. Bearing this in mind, we can the more readily understand why, when this combination obtains, division of the tendo Achillis fails to produce the desired results. The heel is brought down, and the retraction is thus overcome; but the painful adherent cicatrix still remains, and hence the disappointment.

"I very much doubt whether in these cases we should at once proceed to the removal of the two bones (for amputation of the leg would be quite unjustifiable), even though division of the tendo Achillis had individually failed. I would propose, prior to such an extreme measure, that, in addition to the division of the tendo Achillis, a subcutaneous separation or detachment of the adherent cicatrix from the bone be performed, and that reattachment be prevented by frequently moving the soft parts over the bone. By this means we may not only separate the adherent cicatrix from the bone, but, remembering the dissection of Stanski, we may at the same time cut through the abnormal attachments of the tendons of the flexor longus pollicis, &c., to the anterior surface of the os calcis. I have never had the opportunity of putting this measure in practice in adherent and painful cicatrices following Chopart's operation, but I have frequently done so in other cases, and with complete success."

He then gives two instances in which such subcutaneous freeing of the cicatrix had been successful after other operations.

In order to combat the tendency to drawing up of the heel, Mr. Hancock recommends the plan introduced by Mr. Delagarde, of Exeter, who transfixes the tendon of the tibialis anticus with one of the sutures uniting the wound, and so ensures its being attached to the cicatrix. In this way its antagonism to the great extensor muscle (the gastrocnemius) is ensured, and the retraction prevented. If it is thought necessary, the peroneus tertius can be treated in the same way, but Mr. Delagarde considers this superfluous.

In the fourth lecture Mr. Hancock treats of excision of the os calcis. He endeavours, in the first place, to discover the indications for the operation in cases of disease of the foot, and after citing the opinions of various surgeons for and against excision in caries apparently limited to the calcaneum or astragalus, as the case may be, he expresses his own opinion in the following terms:

"I should pause long ere I amputated through the ankle for disease of the astragalus or calcis seemingly confined to those bones, unless there were other cogent reasons to urge me to do so independent of those manifested in the bone itself. And I cannot help thinking that in these and similar cases it is better to be guided by the history, collateral circumstances, and symptoms combined, than to rely implicitly on symptoms and abstract principles alone, however judicious those abstract principles may seem to be. Take, for instance, a very ordinary example. A man sprains his ankle. He pays no attention to it at first, but continues his work. In due course of time, after inflammation, suppuration, the formation of sinus, &c., we discover by the probe that the astralagus is in a state of caries. The disease appears to be restricted to this bone. The disease is the only sign of struma manifested by the patient either in his own person or in his family history. Are we to throw the original cause of the mischief, the general appearance of the patient, and the family history aside; and be governed only by the existence of caries, and the possibility that caries may be latent in other bones, and at once perform amputation without giving the patient a chance by the excision of the one bone of preserving the use of his foot? I can understand that some may consider it justifiable to at once have recourse to amputation where the mischief has originated spontaneously without any assignable cause, when the constitutional taint of scrofula is generally apparent; but I am not ready to admit that caries *per se* is a sufficient justification for the undue sacrifice of a limb, even when occurring in a so-called scrofulous individual, especially if the exciting cause can be traced to injury, or that it is of itself a sufficient justification for abstaining from excision of the individual bone."

In order to ascertain the real results of this operation, Mr. Hancock gives short notes of 18 operations performed by himself and other surgeons, of which the following is a summary:

"In 14 of these 18 cases the patients are especially described as being scrofulous, 2 in impaired health, the remaining 2 only as healthy at the time of operation.

"Of the 14 the disease in 11 was entirely constitutional; in 1 it is said to have originated from a nail having run into the heel, and in 2 to have followed sprains.

"Of these 11, 3 suffered secondary amputation, 1 on account of erysipelas, the other 2 from recurrence of disease in the remaining tarsal bones. One died of diphtheria, which can scarcely be attributed to this operation in particular, and 7 recovered the perfect use of the limb.

"Of the remaining 3, in which the exciting cause is stated to have been accident, 2 recovered completely, whilst the result of the third was doubtful.

"I have thus accounted for 14 out of the 18 cases. The mischief in the 2 stated to have been of healthy constitutions originated from accident. In the 2 described as in impaired health it was idiopathic. The operation, however, was successful in all 4.

"When these facts are made known and duly considered, they will, I trust, be the means of removing the dread with which these operations have been hitherto regarded, and that we shall hereafter have fewer examples of primary amputation for caries of the os calcis, or other tarsal bones. Here we have 11 operations performed for caries of the os calcis, originating spontaneously in scrofulous individuals. In 2 only did the disease secondarily manifest itself in the other tarsal bones."

Besides these cases, of which he produced notes, Mr. Hancock had tabulated a number of other cases, and thus describes the general result:

"To consider the general results of complete excision of the os calcis, I have been enabled to collect the particulars of 34 cases. Of these, 25 recovered completely, 4 suffered secondary amputation, 1 is reported as doing well, of 3 the result is not given, and 1, though doing well as far as the operation was concerned, died of diphtheria. The cases recorded show that this operation has hitherto enjoyed a remarkable immunity from fatal results. In no single instance can we fairly assign death to its performance. We certainly cannot ascribe the case of diphtheria to it. And as for the only other case which I find recorded against it, who for one moment would be inclined to attribute to an operation a death from phthisis taking place seven years after that operation was performed, and seven years after the patient had not only recovered from the effects of the proceeding, but had also recovered the proper functions of the part? The gravest result, therefore, has been secondary amputation. Four cases have taken place against 25 recoveries, or 16 per cent., a very strong argument indeed against the primary adoption of that proceeding."

"Strongly, most strongly indeed, would I urge these facts upon those who still deny the utility of excision of the os calcis as a standard operation—who would still rather sacrifice a foot which might thus be preserved, and restored to a state little inferior to one of perfection.

"And equally desirous am I that all honour should be awarded to him who, by his judicious and skilful proceedings, first established an operation so creditable to British surgery upon a sure and firm basis, and who thus conferred so valuable a boon upon mankind in general. I therefore propose that henceforth excision of the os calcis should be designated by British surgeons 'Greenhow's operation.'"

In the sequel of this lecture the results of and indications for partial operations upon the os calcis are discussed:

New operation for osseous ankylosis.—In the 'American Journal of the Med. Sci.,' April, 1868, p. 360, Prof. Gross, of Philadelphia, describes a new proceeding which he has introduced for the relief of deformity proceeding from bony ankylosis of the knee. It is a modification of one which was invented by Brainard, of Chicago, and which consisted in drilling holes subcutaneously through the femur until it could be fractured, and the limb thus brought straight. Prof. Gross's

operation consists in introducing a drill or small chisel (according to circumstances) into the position of the joint, and thereby severing the bony adhesions until the parts yield. The drill (which is figured in the paper) is similar to that used by cutlers to drill ebony, and either it or the chisel can be introduced through an incision one fourth to one third of an inch in length. Care must be taken in operating at the back part of the joint to avoid injury to the popliteal artery. The operation ought never to be performed in any case of non-osseous ankylosis, nor where there is any inflammatory symptom present. In some cases the tendons must be divided at the same time. The small wound is united at once, and hermetically sealed with collodion, and the limb carefully bandaged and supported on a splint. After some days an extending apparatus is applied and ankylosis is obtained in a nearly straight position. Four cases operated on by Dr. Gross himself, and one by Dr. F. F. Maury, are given. In all a most useful limb was obtained, with but little shortening, the knee having in each case been ankylosed at nearly a right angle.

On a new method of reducing dislocation of the head of the humerus.—At the Frankfort meeting of German naturalists and physicians, Dr. Heine, of Heidelberg, described the following novel plan of reducing a luxation at the shoulder-joint. The case in which it was first applied with success was one of subclavicular luxation of the humerus of 7 weeks' standing. Extension and other means of reduction had been attempted, with the aid of chloroform, but with no success, as the head of the bone could not be lifted over the anterior border of the glenoid cavity. The elbow of the affected side being bent at a right angle, Dr. Heine grasped the arm with his right hand, and the forearm with his left; he then raised the extremity to the vertical position and forced the elbow backwards, so that the upper arm formed an obtuse angle with the posterior surface of the neck (hyperelevation and retroflexion). The humerus was thus converted into a lever of the second form. The scapula formed the fulcrum upon which the surgical neck of the humerus rested, and the head forming the short arm of the lever was, whilst the shoulder was forced by an assistant, readily brought up to the level of the articular surface of the scapula. The arm was then circumducted from behind forwards—the head of the patient being turned to the opposite side; and, as it was finally depressed and rotated inwards, the head of the humerus slipped audibly into the articular cavity. The action of the limb was now free, and the patient in a short time was able to perform nearly all the normal movements.—'Deutsche Klinik,' 46, 1867. (From the 'Brit. Med. Journ.,' Feb. 22, 1868.)

On a rare form of injury of the leg. By Richard Quain, F.R.S. From the 'British Medical Journal,' Aug. 31, 1867.—In his able address in surgery at the late anniversary meeting of the British Medical Association in Dublin ('British Medical Journal' for Aug. 17), Dr. R. W. Smith describes an instance of a very rare form of injury—the separation of the lower epiphysis of the tibia. "'The disjunction,' to quote some of Dr. Smith's words, 'of the lower epiphysis of the tibia is undoubt-

edly among the rarest in this class of injuries. I am not aware of any well-authenticated example of its having been placed upon record, with the exception of one that I published in 1860.'* . . . 'The patient was a boy aged 16 years.' . . . 'I did not see him until six months after the occurrence of the accident.'

"On account of the infrequency noticed by Dr. Smith, it occurs to me that the publication of a case observed by myself very soon after the accident which caused it, may contribute something towards completing the history of the injury. I therefore send the outline of the case from notes made at the time.

"On Oct. 22, 1851, a well-built, healthy looking lad, 17 years of age, was admitted into University College Hospital, on account of an injury near his left ankle, which occurred on the same day a short time before his being brought to the hospital. The patient stated that, while dragging a piece of iron about twelve feet long over a heap of earth in the street, he slipped and fell, his left foot being doubled under him. No further account of the position of the limb in the accident could be got.

"The entire injury was found to be at the lower part of the leg. 'The tibia there projects forwards; and below the prominence is a depression —between it and the foot. The projection of the bone is an inch and a half higher than the lower margin of the fibula, and three quarters of an inch above the lower edge of the malleolar process of the tibia. The space between the prominent tibia and the end of the great toe on the injured side measures three quarters of an inch less than in the other foot.' The ankle-joint was uninjured.

"Two other facts I looked upon as peculiar to this injury—diagnostic of it; namely—1. The edge, so to call it, of the displaced bone was rounded; and the end or lower surface was felt to be smooth, and, as it were rugous—very unlike the hard, angular, almost sharp feel of actual broken bone, and corresponding exactly with the condition of a bone not fully developed, where the epiphysis is connected with it by cartilage. 2. There was an absence of the soft swelling which surrounds the broken ends of bone where any displacement exists—the swelling occasioned by the effusion of blood from vessels torn by the sharp bone at the seat of fracture. Swelling likewise accompanies the displacement of bone at a joint. In that case, however, it results from increased secretion of synovia, not from blood. It was, no doubt, the freedom from swelling which permitted the outline of the prominent bone and the hollow below it to be so clearly defined as they were. The same circumstance permitted the easy examination of the edge and the end of the bone where it projected.

"The diagnosis made out at the time was, separation of the shaft of the tibia from the epiphysis. The case has not hitherto, I believe, been published, except in the account of it given to pupils in the ward of the hospital and in a clinical lecture.

"The replacement of the bone and the treatment (by means of starched apparatus) presented no difficulty and no circumstance requiring notice."

* An example, however, was recorded by the present compiler in the 'Path. Soc. Trans.,' xiii, 187.

On the results of the treatment of ununited fracture by the introduction of ivory pegs through the fragments.—In the 'Lancet' for May 25, 1867, Mr. Birkett relates two cases of ununited fracture of the humerus, in which he followed the above treatment with success. In the first, a simple fracture, in a man, æt. 29, not the subject of any known disease, there was an absence of bony union after five months of local and constitutional treatment. The pegs excited bony deposit in two and a half months, and the arm became quite sound. The pegs remained imbedded.

In the second case the fracture was compound, in a woman, æt. 28, who had suffered in the same accident from compound fracture of the lower jaw, which had united kindly. She was suckling at the time. The pegs were inserted four months after the accident, but did not excite bony union. One peg came away the other remained in the wound, but the arm was ununited when she was discharged, four months after the operation. The same treatment was repeated eleven months after the accident. Partial success was obtained, but there was still mobility at the seat of fracture when she was discharged, fourteen months after the original injury. This, however, gradually diminished, and when last seen, nearly three years after the accident, the arm was as strong, useful, and nearly as well shaped as the uninjured one.

On the treatment of diseased joints by escharotics.—Dr. Fitzpatrick read a paper at the British Medical Association, upon the subject of "Diseases of the Bones and Joints," principally with regard to a new mode of treatment by incision and the deep introduction of the caustic potassa cum calce into the cancellated structure of the articulating extremity of the bone in the incipient stage, or that of inflammatory congestion, and into the joint itself in the very advanced period. He remarks on the unsettled and contradictory state of opinion on the treatment of diseased joints; some surgeons of highest authority advocating early operative interference, whilst yet the constitution is unimpaired by the exhausting progress of disease; other distinguished men putting their faith in rest, with proper mechanical adjustment, and advising that patient trust should be placed in the healing operations of nature. Between those contrasted extremes every variety of opinion and practice may be found to prevail, as boldness excites to action or caution inclines to delay.

The statistics of conservative surgery, more particularly of the great revived operation of excision of the knee-joint, are the reverse of satisfactory; the high expectations formed from the successful cases have not been fulfilled by a sufficient per-centage of cures, and in many instances the reported cures have not been permanent.

"In the surgical charge of the North Dublin Union, the largest chronic hospital with one exception in this country, I have had, during the last twenty-five years, ample opportunity of judging of the effects of rest in the treatment of those affections; and the result of my experience has been most unfavorable. A certain amount of success may be looked for in the treatment of the upper classes, where the purest air, the best nourishment, the most improved mechanical appliances, to-

gether with means of easy locomotion, can be commanded; but, with the lower classes, I have found that the treatment by rest has been a history of failure, disease spreading from bone to bone in the smaller articulations, and, before the consolidation of a large joint could be completed, organic disease having in general invaded the liver or some of the other internal organs. This unsuccessfulness forced me, some years ago, into the discovery of this treatment by cauterization which I propose.

"Having often remarked the healthy reparative action that followed the use of the potassa cum calce in sinuses in the groin, neck, and axilla, I began to introduce it into fistulæ leading down into diseased bone, at first with caution, then more boldly; and finally, disregarding Sir B. Brodie's strong injunctions against letting potassa fusa enter a sinus, I proceeded to carry its action deeply down, converting the small contracted painful orifices into large funnel-shaped openings, and bringing the carious bone into view, and within reach of the further application of the caustic. In this manner several cases of disease of the carpus and tarsus, and of the flat and superficial bones, were successfully treated; the caustic being reapplied at intervals of a few days, to keep the orifices freely open until the carious bone had disappeared or was covered over with firm granulations.

"In a similar manner, several cases of chronic necrosis were treated, the caustic being very freely used, destroying all foul undermined integument, and leaving, after the removal of the sloughs, large, clean, circular openings, more than an inch in diameter, and extending deeply down to the sequestrum, into contact with which the caustic, in stick and powder, was freely brought. In this manner, two cases of necrosis of the fibula, very similar to each other, in which numerous openings led down to diseased bone, and where the patients were reduced to the lowest state by years of suffering, were perfectly cured within six months.

"In a case of necrosis of the heel in a delicate lad, who was deformed by the effects of an old hip disease, a caustic perforation was made at each side of the heel, and the powder was brought into contact with the dead bone, until it was so removed that a catheter was passed quite through the heel, no inflammation nor constitional disturbance having been caused or excited.

"I can speak with the utmost confidence of the application of this remedy in all such cases of caries affecting the superficial bones. The caustic perforations may be multiplied in proportion to the extent of the disease, respect being paid to important nerves and vessels, and care being taken not to destroy sound structure or periosteum beyond the limits of the diseased surface of the bone. Before I speak of the application of this remedy to the arrest of the early stage of joint disease, I may be permitted to allude to the important question, as to the structure which is first attacked. My own opinion accords with those authors who believe that, in the great majority of cases, the disease commences in the cancellous structure of the heads of the articulating bones. That there are rare cases where it begins in synovial membrane or cartilage, and mixed ones which, seen at a later period, may perplex

diagnosis, I fully believe; but I consider that those instances where the *fons et origo mali* arise in the bone preponderate enormously. My own opportunities of obtaining pathological evidence have left me without a doubt on the subject, and the practice which I propose is based upon that conclusion.

"In Sir B. Brodie's great work on the joints, he recognises the fact of the frequent origin of disease in the cancellous structure; and he describes the distension of the heads of the bones with a reddish medullary fluid, then softening of the tissue, and finally suppuration; the matter either forcing through to the cavity of the joint, or reaching the surface at some position more or less remote; but, whilst he thus clearly recognises the cause, and graphically describes the disastrous effects, he forbids the remedy, and strongly cautions against an early or premature opening, although he had himself with success trephined the heads and shafts of the long bones in cases of painful and circumscribed abscess. That he attempted to give relief in a similar manner in those cases of acute articular osteitis which he so circumstantially describes, is more than probable; and I therefore infer that his caution against the early opening of an inflamed bone was founded on his experience of ill consequences that followed such a proceeding.

"Notwithstanding the teaching of this great authority, I venture to propose interference by operation at the very earliest moment that congestive inflammation of the head of a bone can be fairly diagnosed; and I state with confidence, that a perforation made into the cancellous structure, if freely cauterized with the potassa cum calce, will be followed by relief from pain, and that the inflammation which ensues will be only such as is attendant on, and accompanies, reparative action.

"The caustic tunnel may be made at once by cutting down on the bone and piercing the compact tissue with a strong knife, trocar, or small trephine, and then freely cauterizing the full extent of the perforation; or, in less acute cases, a small eschar may be first made, the centre of which being incised, the caustic can be introduced; and, by combining its action with the knife, the tunnel can be carried deeper from day to day in a gradual manner. By means of this combined caustic perforation, I succeeded in arresting disease in its first onset in the head of the radius, in the case of a young man, æt. 24, in the year 1861. Since that time I have tried it with success in several cases of incipient disease in carpal, tarsal, and other superficial bones. I perforated the tibia above the internal malleolus in several instances with curative results; also the great trochanter in cases where its structure, or that of the head and neck of the femur were the seat of the osteitis, the cavity of the joint being yet unaffected.

"On April 26 last I exhibited a young man at the Surgical Society of Ireland, into whose trochanter a caustic tunnel had been inserted on March 22 preceding, and which was still freely open. The wasted buttock, obliterated fold of nates, and emaciated state of the entire limb, still existed to proclaim the nature of the disease, but all pain had ceased; the motions of the joint were in a great measure restored, and he walked about before the members of the Society without lameness, although, for three months before the operation, his thigh was flexed,

he had constant pain in the hip and knee, and he could not admit abduction, or any extended motion of the limbs. This patient took his discharge to work on May 11; the contour of the limb being almost restored to its natural fulness, and his general health quite recovered.

"Although strongly recommending this treatment for the early stages of acute articular osteitis, and also for the very advanced periods, when caries is established, or when a whole joint is converted into a foul suppurating cavity, my experience does not warrant me in advising the practice so strongly in the intermediate periods, where the head of a bone may be the seat of a diffused suppuration, possibly communicating with the joint itself; the caustic, I fear, in this condition of parts, could not extend sufficiently to protect from the constitutional disturbance and risk of pyæmia that might follow."

The following extracts refer to the excision of bones and joints:

Excision and regeneration of the entire clavicle. By John Wm. Irvine.—"George W—, æt. 16, was admitted into the West Derby Union Hospital on the 18th of June, 1866, in consequence of serious disease of the right clavicle, the central portion of which was completely exposed.

"On admission the patient was in a very exhausted state, having symptoms of hectic, and a constant purulent discharge from a wound which left an inch and a half of the central portion of the right clavicle perfectly denuded of periosteum, and of a glistening white appearance. He was put upon good diet, and such tonics as were calculated to bear up his strength; but, in spite of all efforts, he continued to lose flesh, and became more and more depressed in spirits, until July 2, when abscesses began to show themselves near the sternum and scapula, and I determined to resect the clavicle.

"Chloroform having been administered, I made an incision over the entire length of the bone, and then, as far as possible, dissected the periosteum from its superficial surface. I then disarticulated the sternal end, and so placed a spatula as to elevate the bone, proceeding to further separate the periosteum, which, to my delight, I found practicable without very great difficulty. I found it necessary to dissect with extreme care, owing to the painfully perceptible pulsation of the subclavian artery, but with perseverance I managed to remove the clavicle comparatively free from its periosteal covering.

"On September 1, two months after operation, the entire wound had cicatrized, and the patient had gained more than a stone in weight from the date of operation. He had been able to sit up, and use his arm in playing dominoes, for ten days past.

"On September 20 he expressed himself as quite able to follow his usual employment, and made an urgent request for his discharge, which was complied with.

"It was evident, on examination, that very considerable regeneration of the removed bone had taken place, and was likely to result in a serviceable, if not very elegant, clavicle. The patient was cautioned not to

use his right arm any more than was positively necessary, and left the hospital in excellent spirits.

"An examination of the clavicle after removal convinced me and every other surgeon who saw it that any operation short of entire extirpation would have proved unavailing. The scapular end of the diseased bone, especially its under surface, was found to be most affected, but the sternal end was considerably disorganized. The articular surface of the sternum was healthy.

"On December 31, six months after operation, I had an opportunity of seeing the patient for the first time after his discharge, and found that he had meanwhile been actively employed at his own business, and had for some weeks been able to use his right arm as perfectly as ever. Occupying the place of the resected clavicle is a new bone, of rather beyond the normal length, and considerably wider, but more flat and thinner, than the original one. This regenerated clavicle plays its part with perfection, allowing the boy to use his arm as efficiently as though no disturbance of the parts had taken place. It is interesting to notice the accuracy with which the limits of attachment of the clavicular muscles can be clearly defined when muscular efforts are made."

Subperiosteal resection of the head of the humerus.—In M. Ollier's large work, entitled 'Traité expérimental et clinique de la Régénération des Os et de la Production artificielle du Tissu osseux' (Paris, 1867), vol. ii, p. 325, is related a case of subperiosteal resection of the shoulder in a man, æt. 56, for disease apparently of a rheumatic nature. An incision, not quite three inches in length, was made on the anterior aspect of the shoulder, starting from a fistulous opening just below the coracoid process; the capsule was opened, the tuberosities of the humerus denuded with the greatest care, and the long head of the triceps pushed aside. In pushing the head of the humerus out of the wound to saw it off, the bone, which was very fragile, was broken at its lower end, just above the condyles. This accident, however, exercised no unfavorable influence on the result of the case. The patient was discharged from hospital a fortnight after the operation, and, after recovery, had a very useful arm, with unusual power of elevating it; the distance to which the elbow could be separated from the chest was about seven inches, and this distance increased (as stated in the appendix) till he could almost raise the arm to a right angle. In this operation M. Ollier dwells on the great importance of doing as little harm to the deltoid as possible, and not injuring the nerve which supplies it.

At p. 45 of the same volume M. Ollier relates the case of a girl, æt. 15 (Louise Gaillard), in whom he removed, together with the head, nearly five inches of the shaft of the humerus subperiosteally. In this case a nearly complete tube of periosteum could be distinguished at the operation. There was no considerable bleeding; only two arteries were tied. This was done on Sept. 16, 1864. A drawing is given representing the bone removed, the size of nature. Another drawing represents the girl after her recovery, to show how perfect the reproduction was; and the following account is given two and a quarter years after

the operation:—Of the 12 centimètres of bone removed, about 10 had been reproduced, the arm being shortened about 15 millimètres. It had not grown since the operation, while its fellow had grown considerably, so that it was nearly two inches the longer. The shape of the shoulder showed that the reproduced head of the humerus had not the normal volume. A resisting body could, however, be felt rolling in the situation of the head on passive motion. The elbow could be separated from the trunk about five inches. The arm was solid. Passive motion at the shoulder was limited by periarticular adhesions. She had good use of the member, and worked in a cigar manufactory.

Subperiosteal resection of the elbow.—In the same work there are elaborate directions for the performance of this operation, and a list of 12 cases in which it has been performed at Lyons. With regard to the first point, it is sufficient to say that the parts are to be freely exposed by an incision at the posterior part of the joint, either on the outer or inner side of the olecranon process, so as not to wound the tendon of the triceps. This incision is to be carefully extended to the bones, and the periosteum and other tissues inserted into the bones are to be reflected with great care from the olecranon, and from the condyles and back part of the humerus. This detachment is to be effected with a sharp rasp or chisel where the tendons are inserted, and these, of course, will be severed at the same time. Then a chain-saw is to be passed underneath the humerus by means of an instrument of a peculiar construction, which is really a curved rasp, grooved on its upper surface to receive the chain-saw, and having an eye, into which a string to carry the chain-saw is passed. The humerus, having been thus divided, is cleaned carefully on its anterior surface. The ulna and radius can be divided with a common saw from behind, or with bone-nippers. The ulnar nerve, being raised with the periosteal structures, does not come into view, and is not endangered. M. Ollier also says that there is much less bleeding than in the ordinary operation. The subperiosteal method is, of course, more laborious and difficult. It aims at preserving not merely the periosteum, but also the capsule of the joint and the tendons down to their insertion; and its alleged advantage is, that the olecranon and the condyles of the humerus will probably be regenerated, affording a much more favorable insertion for the triceps muscle, and a much more complete joint, with greater facility of movement. Out of M. Ollier's 12 cases, 3 died from pyæmia or erysipelas. In 2 cases the operation was recent. Out of the other 7, in 1 case the patient died of scarlet fever eight months after the operation, and, unfortunately, no examination of the parts was obtained. In another case, also, the terms in which the ultimate result is described are undecided. In all the remaining, reproduction of the articulation was inferred from the external examination, and the movements were good.

In the 'British Medical Journal,' Oct. 31, 1868, is a paper read at the Oxford meeting of the British Medical Association in August by Dr. W. Stokes, jun., of Dublin, on "Periosteal Preservation in Operative Surgery," in which he refers to 3 cases of excision of the elbow by this

method in his practice. In 2 of these cases there was "a most obvious reformation, not only of the condyles, but also of the olecranon." The third case terminated fatally, but was not examined after death.

In the 'Gazette des Hôpitaux,' 1857, p. 14, M. Laroyenne, of Lyons, relates a case of subperiosteal resection of the elbow after M. Ollier's method, *i. e.* with preservation of all the periosteo-capsular tissue. The operation was followed by the formation of a new ginglymoid joint, in which a reproduction of the olecranon could be plainly traced.

In an article by Dr. Hueter on the resections performed in the Royal Surgical "Klinikum" at Berlin from the years 1862 to 1865 inclusive, in 'Langenbeck's Archiv,' viii, p. 136, we find the following observations on subperiosteal resection of the elbow:

"The preservation of the periosteum is now carried out by Langenbeck in resection of the elbow with very satisfactory results. After the longitudinal incision has been made in the line separating the inner from the middle third of the olecranon, through the triceps down to the periosteum, the latter is also cut through longitudinally, and then the periosteum is freed from the olecranon with the elevator or the raspatory. At the tip of the olecranon a few strokes with the knife held perfectly horizontal are required to free the tendon completely from the bone. Thus, the triceps tendon can be preserved in the fullest possible connection with the fascia of the forearm. Also in the clearing of the condyles and end of the humerus large portions of the periosteum may be preserved. At the end of the operation the separation of the tendon of the brachialis anticus, together with the periosteum from the coronoid process, is of great importance, so that the connection of the tendon with the bone is almost entirely preserved. If the periosteum be somewhat swollen and loosened, the resected bones can be extracted almost as free from all soft parts as if they had been macerated for weeks. In other cases the preservation of the periosteum can be accomplished only in a certain extent, and in some not at all. Still, some stress must be laid on this preservation, since thus the operative proceeding becomes much simpler, unpleasant lesions of the soft parts are impossible, the articular arteries hardly ever need tying, and, finally, because there ensues a much more extensive production of new bone, and therewith a much more complete new joint is formed. I have now frequently had occasion to ascertain beyond all doubt by palpation that a new olecranon had been produced. The new joint is even provided with synovia, since in the subperiosteal resection there are always large portions of the capsular membrane left behind. I have in some cases seen quite clearly synovia running out of the wound, and in a little boy who had been discharged cured after excision, some years since, I had to treat a dropsy of the new elbow-joint by painting with iodine, and ultimately by the plaster-of-Paris bandage."

In the 3rd part of the 9th volume of 'Langenbeck's Archiv,' p. 911 (which has only recently come to hand), there is a very interesting description by Dr. Doutrelepont of the dissection of an elbow four years after subperiosteal resection. The condyles of the humerus had been very perfectly reproduced, and the olecranon had been reproduced to even an inconvenient extent, for it was so long and curved as some-

what to limit extension of the arm; the head of the radius was also regenerated, though less perfectly. There was a perfect joint, with a complete capsule between the ulna and humerus. The muscles were as well developed on that side as on the other, and there was no shortening appreciable by measurement.

Excision of both elbows.—In the first volume of the 'Clinical Society's Transactions,' p. 143, the present compiler relates a case (the first which, as far as he can find, has been published) of excision of both elbows, showing the propriety and success of operations in cases of so-called strumous disease, even when several joints or parts of the body are attacked, and the great usefulness of the arms when the elbow has been successfully removed on both sides.

Subperiosteal resection of a large portion of the entire circumference of the femur.—In the 'Brit. Med. Journ.,' May 2, 1868, Mr. Joseph Bell relates a case of acute periostitis of the femur, terminating in necrosis of the entire circumference of the shaft of the bone, in a boy æt. 10. The patient having been in a very weakly and distressed condition during the early part of the case, no new bone was formed. Rather more than four months after the commencement of the disease the upper end of the dead bone separated from the living, causing spontaneous fracture near the trochanter. There was then so little resistance in the periosteal tissues that the limb became nearly six inches shorter than the other; the knee-joint also became inflamed, the leg greatly swollen, and the boy's condition so bad that it was necessary to do something to relieve him from the irritation. About a month after the fracture the dead bone was extracted, without any difficulty, through a free incision on the outer side of the thigh. It measures in the drawing six inches, and in the lower half the whole thickness of the femur is comprised. The interior of the periosteum was plugged with lint to repress hæmorrhage. The membrane was "thickened, but barely ossified." After the removal of the bone ossification went on with great rapidity, and no unfavorable symptom ensued, except the exfoliation of very numerous fragments of bone. The boy had completely recovered eighteen months after the commencement of the attack, could walk and run nimbly with a high-heeled shoe, having regained the use of the knee-joint almost entirely. The limb was shortened one and three quarters of an inch, and was well nourished, being only three quarters of an inch in circumference less than the other. Mr. Bell states that no parallel case had then been published, except one by Dr. Handyside in the 'London and Edinb. Journ.,' Dec. 1844.

A case exactly parallel to the above, except that the portion removed was not so long, will be found related by the present compiler at p. 395 of a work 'On the Surgical Treatment of Children's Diseases,' recently published.

Subperiosteal resection of the knee.—In the 'Gazette Médicale de Paris,' 1867, p. 601, is a note by Sig. Larghi (extracted from the 'Giornale' of the Royal Academy of Medicine of Turin for Aug. 13, 1867) relative

to the operation for the subperiosteal resection of the knee, which is also described by the same author in the 201st vol. of the 'Ann. Univ.' The leg is to be bent on the thigh, the anterior tubercle of the tibia and the articular borders of the internal and external condyles of the tibia are to be made out. The operator raises with the point of a triangular knife from below upwards all the soft parts from the tubercle of the tibia, including the insertion of the rectus femoris, and stripping the periosteum from it. Then he makes two cutaneo-periosteal incisions parallel to each other, and directed upwards along the right and left borders of the ligamentum patellæ to the centre of the articular surface of the tibia. Having arrived so far, he opens the capsule, and, following the upper border of the internal condyle, incises the skin and detaches from their insertion the aponeurosis, the inferior extremity of the tendon of the biceps internus, and of the corresponding portion of the capsule. He then does the same on the outside of the knee as he has done on the inside, incising the skin, and detaching from their insertions the aponeurosis and the inferior extremities of the biceps externus, and of the corresponding part of the capsule. It does not require to be mentioned that in order to preserve intact the ends of the tendons, capsule, and ligaments, the superficial layer of bone must be detached from the tibia, or at least the periosteum stripped off. While the operator is making these incisions his assistant keeps flexing the leg more and more, and the parts being thus on the stretch, it is easy to detach all the tissues from the articular border. The joint being more and more opened by the extreme flexion, the operator, with the point of the triangular knife, detaches the superficial layer of bone from the anterior tuberosity of the tibia (the anterior insertion of the crucial ligaments). The joint being still further open by the section of these ligaments, the operator directs his knife towards the inner side, and detaches the lower end of the internal lateral ligament and of the corresponding portion of the capsule, then he pursues the incision on the outer side, and detaches the lower end of the external lateral ligament from the fibula, and the corresponding part of the capsule; and the assistant continuing to flex the limb, the operator completes the detachment of the posterior portion of the crucial ligaments, should these ligaments not be completely severed. The joint is now very fully exposed. The periosteum is then to be severed from the femoral condyles, and the diseased portion of that bone dealt with according to circumstances. If necessary, the periosteum may now be detached from the tibia, and the bone excavated to any necessary extent. No directions are given about the patella, but it could, of course, be excavated entirely or to any required extent from its articular surface, which is exposed and turned up in the commencement of the operation.

Excision of the knee.—In the ninth volume of 'Langenbeck's Archiv,' Dr. König, of Hanau, has given an account of his personal experience of this operation, and some general observations on the operation, chiefly with regard to its performance in childhood. Dr. König has paid particular attention to the position of the epiphysial line, and gives exact measurements of its position, both in the femur and tibia,

soon after birth and at the ages of 11, 16, and 18, together with an accurate representation of the bones at the age of 11. For the exact measurements we must refer to the original. His general conclusions are as follows:—That both epiphyses grow at about the rate of between two thirds and one mm. per annum. It is safest to assume the growth at only two thirds of a mm. for each year. (A millimètre may, in a rough calculation of this sort, be taken to be equal to 1-30th of an inch. It is really a very little more.) In the new-born infant it is situated in the femur, at an average height of nine mm. from the highest point of the intercondyloid fossa, fifteen mm. from the middle of the edge of the internal, and twelve mm. from that of the external condyle. In the tibia it is, on an average, eight mm. from the articular surface.

Dr. König dwells on the importance of not removing the whole of the epiphysial line, if it can possibly be avoided. In cases where disease has spread higher he recommends either removing portions of the circumference of the bone with the saw, or chiselling out the diseased spot if it be in the interior of the bone. He remarks, however, that if it be necessary to take away so large a part of the bones as to overstep the limits of the epiphysis, although this will leave the patient with a shortened limb, such a result is inevitable, inasmuch as disease of the epiphysial line is in itself liable to be followed by loss of growth. In support of this statement he refers to the constant occurrence of shortening after spontaneous cure of old disease of the knee; and although he allows that some of this shortening is due to dislocation, and some of the loss of growth is to be ascribed to disuse, still he is inclined to attribute a great share of it to affection of the epiphysial cartilage. He supports this statement by measurements taken from a few cases of old dislocation of the knee from disease. Thus, according to him, shortening is invitable in such cases; while excision, if successful, will leave the limb much stronger and more useful.

With regard to the mortality after the operation, he has collected, out of the published cases, all those in which the age did not exceed sixteen—112 in all, of which 20 died from the direct effect of the operation and 2 after consecutive amputation; 11 others were amputated, and in 9 others the operation seems to have failed. All the others he counts as successful. The mortality contrasts favorably with what is known of the results of the same operation at a later period of life, but no materials exist for comparison with the mortality after amputation for similar disease at the same age.

Dr. König is not in favour of Langenbeck's attempt to produce a movable new joint. He says, "However convinced I am of the excellence of the endeavour to preserve for the patient a real knee-joint, yet I hold excision of the knee to be an operation which is not yet so well established as to be able to bear a large proportion of failures. A universal attempt to procure a movable joint would probably lead to this result—it would probably, besides a few movable and useful joints, produce a larger number of useless, flail-like joints, and all the more since the operation would have to be performed and the after treatment directed by less experienced hands than those of the distinguished surgeon of Berlin."

Dr. König's paper concludes with some very good observations on the steps of the operation, and a warm recommendation of the plaster-of-Paris bandage applied on the operating-table. This is the only way, according to him, of securing complete immobility of the limb; and if this end is secured, he confidently anticipates a considerable diminution of the death-rate.

In the 'Medical Times and Gazette,' Feb. 1 and Feb. 8, 1868, Mr. H. Smith has given the results of all the cases of excision of the knee performed in King's College Hospital during the sessional year commencing Oct. 1, 1866. The operations were 14 in number, under the care of Sir W. Fergusson, Mr. Partridge, Mr. Wood, and Mr. H. Smith. Two only proved fatal, both from pyæmia, consequent on osteomyelitis of the femur. One of these was a woman aged 20, the other a girl of 5. Of the 12 successful cases one was a woman between 20 and 30; two were men 23 years of age; the rest were children of the ages of 15, 14 (two cases), 12 (two cases), 10 (two cases), 8, and 6, respectively. One was a case of renewed resection at the age of 12. The failure of the previous operation was found to be due to necrosis of a portion of the femur, and around the necrosed bone one of the old ligatures was found twisted. One of the cases was in much danger of death from secondary hæmorrhage, and another had many of the symptoms of pyæmia. In one case (No. 9) "the union was not quite firm, several exfoliations of bone had occurred, and sinuses were not yet healed," at the date of the last report, ten months after operation. This was in the oldest patient of the series, who was in a very bad condition of health before the operation. In a few of the cases the union seemed fibrous only.

Mr. Smith concludes thus:

"I have now furnished you with a plain unvarnished report of our experience of excision of the knee-joint during the last twelve months, and I think the result of this experience teaches us, in the first place, that the mortality attending this operation is not so great as it is generally supposed to be. Two fatal cases out of fourteen operations is as slight a mortality as can reasonably be expected after any severe surgical proceeding.* Next to this slight mortality, I may mention that these cases teach us how very slight is the shock of the operation. In most of the cases there was scarcely any, and in the two or three where the shock was noticeable there had been ample cause for it, either in excessive bleeding or in a very difficult and prolonged operation. These cases also teach us another fact, about which there has been much misapprehension, viz. the absence of great exhaustion and depressing effect on the constitutional powers by the long-continued discharges which occur from the wounds during the after treatment. Now, in several of these cases the wounds healed in a great degree by the first intention,

* I would observe upon this that the cases were almost all (10 out of the 14) in children, and the rest were quite young adults—all the operations being for chronic disease of the knee. Yet the mortality (1 in 7) is exactly what Mr. Bryant's and my statistics have given as that for pathological amputation of the thigh at all ages—thus bearing out the conclusion which all experience tends to confirm, that excision is a more fatal operation than amputation, taking similar cases for the comparison.—T. H.

and in others where no such result could take place—as, for instance, where profuse bleeding occurred after the operation in my case—the patients did not seem to feel the depressing effect of the open wounds.

"In conclusion, there is one important point to which I wish to call attention—that out of the whole fourteen cases there was not a single instance in which the operation was performed for a deformed condition of the knee alone. In every instance there was either extensive disease alone or a deformed and useless limb combined with more or less disease within the joint."

In the 'Deutsche Klinik,' 1867, p. 393, a case of resection of the knee by Prof. Volckmann is related, which deserves quotation as being one of the few cases recorded of recovery from excision of the knee for injury, as well as on account of the singularity of the accident. The patient was driving a locomotive engine which left the road, and he was buried in the ruins of the engine and his leg fixed immovably, while a stream of boiling water from the engine was directed against the external surface of the knee on the same spot for twenty minutes. The result was sloughing of all the coverings of the joint and necrosis of the outer condyle of the femur. On the separation of the slough a hole was found in the joint, exposing necrosed bone in the patella and femur. The patient was gradually sinking under the resulting suppuration, when it was decided to excise the joint, which was done with good success. It must be added that the surgical fever was never at any time excessive.

Subperiosteal excision of the os calcis.—In the work already referred to on p. 258, ii, p. 272, M. Ollier describes a proceeding by which he has succeeded in removing the entire os calcis, leaving the periosteum behind, and dividing no tendons except the tendo Achillis at its insertion. An angular incision is made with its vertical part along the outer border of the tendo Achillis, and its horizontal part along the external edge of the foot as far as the end of the fifth metatarsal bone. Care is taken in the latter proceeding not to cut the peronæi tendons. After all the soft parts, including the periosteum, are scraped off the posterior part of the external side of the os calcis, the tendo Achillis is carefully separated, with a sharp raspatory, from the bone and thrown inwards, together with all the soft parts covering it. Next the inferior face of the bone is cleaned, and the peronæi tendons are exposed and drawn forwards by an assistant with a blunt hook. The external lateral ligament is then detached, and the calcaneo-cuboid joint opened. The next step is to introduce a thin knife into the calcaneo-astragaloid articulation, and thoroughly divide the interosseous ligament. The bone is now drawn down with a strong pair of toothed forceps, and the calcaneo-scaphoid ligaments detached. Then, the soft parts being drawn inwards with blunt hooks, the internal surface of the bone is cleaned, and the remaining adhesions will give way as it is twisted out.

M. Ollier adds that in this operation one can hardly avoid wounding the sheaths of some of the tendons, but that such injuries are far less

than those necessarily accompanying the ordinary methods of resection ; that even if the bone is not regenerated, the periosteal sheath remains to afford to the tendo Achillis a more firm means of attachment to the bones ; and that this is, of all the subperiosteal resections, that which affords the most incontestable advantages, even apart from the prospect of the regeneration of the bone removed.

M. Ollier gives three cases in which he has performed this operation. In one the patient died two months afterwards. Some detached masses of bone were found in the scar, and the periosteal sheath was thickened. The two others recovered, and in both M. Ollier thought he detected traces of reproduction of the os calcis, less flattening of the heel than is the case after the ordinary operation, and better use of the foot.

In the 'Gaz. des Hôp.,' 1867, p. 122, may be found a short report of a discussion at the Soc. de Chir. on subperiosteal resection, *àpropos* of a case by M. Giraldès of this operation on the os calcis, followed by apparent reproduction of the bone. In another case of subperiosteal resection of the tibia no reproduction had occurred. M. Le Fort observed that in some cases (of which M. Giraldès' was one) it was impossible to remove the bone otherwise than subperiosteally, since that membrane was already detached. He doubted the value of the periosteum in resections of joints. MM. Perrin and Larrey were of the same opinion, and held that the clinical facts adduced in support of M. Ollier's hypotheses were as yet insufficient.

Excision of os calcis.—In the 'Gaz. des Hôp.,' 1867, p. 83, M. Rigaud, of Strasbourg, communicates short notes of 6 cases of his own, and 1 of Prof. Boeckel, of complete removal of the os calcis. (1) A boy, æt. 10 ; cure in one month. No change required in the common shoe. After a short time no limping could be detected. (2) A man, æt. 30 ; death in three weeks from pyæmia. (3) A man, æt. 35 ; recovery in three months. Slight limping. A thick-soled boot was at first worn, but it was found useless, and he resumed the use of a common boot. (4) A man, æt. 27. The recovery was slow, but complete. He walked without any sensible limp, using a common shoe. (5) A boy, æt. 14 ; recovery in five weeks, without any limp or any change of shoe. (6) A boy, æt. 15 ; recovery in two months, with good walking power. (7) A boy, æt. 10 ; rapid recovery without lameness. The first case dates as far back as 1848. M. Rigaud's method of operation does not involve any injury to nerves, vessels, or any tendon except the tendo Achillis.

In the 'New York Medical Record' for May, 1867, Dr. Burrall relates a case of excision of the entire os calcis, performed according to the plan recommended by the present compiler in the 'Lancet,' Jan. 21, 1865. The operation appears to be a comparatively new one in America, only two previous instances being referred to in Dr. Burrall's paper, both of which were successful. In the present instance, as in so many others, there was no strumous history or symptom of general struma. The patient was a boy, æt. 8, and the disease appeared to have

been caused by exposure to cold in long standing on the ice. Amputation had been recommended. The child recovered rapidly and completely, and the ultimate result is thus stated:

"At present (March 7) the boy attends school, and walks and runs in ordinary shoes without difficulty. Scarcely any limp remains, and no apparatus has been necessary. The foot has become reduced almost to the size of its fellow; the inversion has disappeared, and the heel is resuming a natural appearance, growing firm and full. The tendo Achillis has become strongly united, and the movements of the foot, with the exception of eversion, which was very limited before the operation, are performed with facility. It is no exaggeration to characterise the result as very satisfactory."

Resection of the whole tarsus.—In 'Langenbeck's Archiv,' viii, p. 173, Dr. Jaesche, of Nishni Novgorod, has published his experience of various resections. Amongst others he gives some particulars of a case in which he extirpated all the tarsal bones, preserving, however, the attachment of the tendo Achillis. As the operation proved fatal from pyæmia in the third week, no conclusion as to the value of the operation can be deduced from it, but its unusual nature appeared to entitle it to notice. Dr. Jaesche did not anticipate such extensive caries as he found. He intended to have removed the anterior ends of the astragalus and calcaneum, with a portion of the cuboid, and possibly the scaphoid. Accordingly he made a transverse incision across the foot at the level of the joints between those bones, and a short longitudinal incision on either edge of the foot. After extirpating, however, the whole astragalus and the os calcis, except a small portion of its back part, which was left attached to the tendon, like an empty egg-shell, it was found that the anterior tarsal bones were equally diseased, and they were all removed, together with the head of the second metatarsal bone. Dr. Jaesche says the bleeding from the dorsal arch of vessels was trifling, but he does not exactly specify what parts were divided. He says that the tendons and vessels would have been better avoided had he been prepared for so extensive an excision, if he had used two long incisions, one on either side. After death the principal wound was found almost healed, and there was a considerable quantity of pus in the sheath of the tendon of the extensor longus digitorum, and also in the deep part of the wound. The external malleolus had been broken off, and was in process of death.

The following extracts refer to affections of the brain, nerves, spinal cord, and organs of special sense.

Trephining the skull.—In 'Schmidt's Jahrb.,' 1865, 127, p. 60, Martini gives an abstract of some recent contributions to the subject of trephining in injuries of the head. The first is that of Fischer, in the 'Archiv f. Klin. Chir.,' vi, 3, p. 595, 1865. This author gives 5 cases in which, after injury to the head, producing compound comminuted fracture with depression, suppurative meningitis came on in a few days, followed by death, antiphlogistic measures being of no avail. This, he says, cannot be attributed merely to exposure and contusion of the

dura mater, since cases enough are on record, and two have been recently observed by himself, in which the dura mater has been exposed in injuries of the skull, without any meningitis following. The same is also observed in experiments on animals. Assuming, then, that the meningitis in those 5 cases was not caused merely by the exposure of the dura mater, he proceeds to some experiments as to the effect of foreign bodies lodging in the brain. In the first place, with respect to the consequences of a foreign body lodging in the brain without exposure of the cranial cavity, he gives 4 experiments on animals by driving nails through the skull into the brain, and 2 cases in the human subject of simple fracture with depression. In the animals no meningitis was produced. In one of the cases of fracture the patient lived thirty-five years, and then died from causes unconnected with the fracture, which had never set up inflammation. In the other case the patient died, but from hæmorrhage, causing pressure, not from fracture. Hence he believes that if the cranial cavity be not exposed, the foreign body will probably cause no primary meningitis. When foreign bodies pass through the dura mater and wound the brain, the cranial cavity being open, they may be either movable or fixed. Experiments on animals show that in the former case meningitis is at once set up, in the latter the inflammation moves on more slowly, but equally regularly. The author attributes the more rapid access of inflammation in the former case to the movement communicated to the foreign body by the motions of the brain, and says that when they are increased by coughing, &c., the patient is in still more danger, as also those who are of lively temperament, who speak and laugh much, those who have to make strong efforts to pass fæces or urine, &c. The experiments also show that if the opening of the dura mater is large, so that the movements of the brain are considerable, and if the foreign body is large and rough, and situated near the centre of the opening, the inflammation is more rapid and acute. In cases where the meningitis proves fatal, and spreads to both sides, there is never the least difficulty in showing by post-mortem examination that it takes its departure from the lodgment of the foreign body. From these data the author concludes that when foreign bodies are known to have lodged in the brain, or when there is any reasonable probability that they have done so (the cranial cavity being open), an exploratory operation should be undertaken at the earliest moment possible, and the foreign body carefully removed, and the cranial cavity closed. On this head experiments are also adduced, showing the benefits of early removal of the foreign substance.

The second publication is one by Wysler, of Aaran (ibid., p. 768), in which two successful cases of trephining are published, but which is also intended to prove the benefit of the energetic use of mercury in injuries of the head, by inunction of mercurial ointment in various parts of the body, so as to get the whole system quickly under its influence. It is to be remarked that in neither case was the trephining undertaken immediately after the accident; in one case on the following day, in the other not till four days after. Mercurial inunction was freely used in both.

The last contribution is a very interesting and rare case of successful

trephining, eight months after gunshot injury, by Balassa, at Pesth, in 1849, for paralysis of sight, hearing, and speech, and partial hemiplegia, and epileptiform convulsions. Some pus was found under a depressed piece of bone, and the patient gradually recovered, but with recurrences of palpitation, not accompanied with total loss of consciousness, at rare intervals. The patient came into the ward of Prof. Pitha in 1864 on account of an accident, and his condition is described by Dr. Scholz in the 'Allg. mil. ärz. Ztg.,' 1, 1865. Some remains of the paralysis were still to be noticed in weakness of the right side, and difference in the focus of the two eyes.

Encephalocele successfully removed.—In the 'Edinb. Med. Journ.,' April, 1867, Mr. Annandale relates a case in which he successfully removed a tumour from the back of the head, evidently encephalic. At the time of removal the infant was seven weeks old. The tumour had been the size of the child's head at birth, "and shortly afterwards was tapped by the mother's medical attendant, and a large quantity of clear fluid drawn off. The sac speedily refilled, and was attacked with inflammation, which was followed by sloughing of the most dependent portion of the tumour, and an escape of purulent fluid, which has continued ever since. On examination I found a pedunculated tumour, the size of a large pear, hanging from the occiput. At the lower extremity of the tumour there was a ragged opening (large enough to admit the points of three fingers) which passed into a granulating cavity nearly the size of a hen's egg. The remainder of the tumour was composed of solid textures, principally skin and areolar tissue, thickened and œdematous. The pedicle or neck was fully an inch in length, and almost as thick as an adult thumb. It felt solid in consistence, and was closely connected with an opening which could be felt in the occipital bone immediately below its occipital protuberance, although no actual communication could be detected between it and the interior of the cranium. The opening in the occipital bone was about the size of a shilling. The scalp round the pedicle and the skin of the upper part of the neck hung loose—a result of the original large size of the tumour. The cavity already referred to was suppurating freely, and the child's strength was beginning to fail very much from this cause." A double ligature was tied upon the pedicle, and the mass removed. The child suffered no inconvenience from the operation, and recovered completely, in spite of a sharp attack of measles. On examination of the tumour removed, besides a large granulating cyst or cavity, there was found a process of solid substance firmly adherent to and inseparable from the surrounding areolar tissue. At the side of this was a canal the size of a crow-quill opening into a pyramidal elevation on the wall of the cyst. Microscopical examination did not discover any nerve-fibres in the process, though some resemblance to the delicate connective tissue of the cerebrum was believed to be perceived.

Mr. Annandale remarks upon this case—"Experience has shown that surgical interference in cases of encephalocele and spina bifida is very rarely advisable. The case just related illustrates a condition of

the disease which, perhaps, is the most favorable for an operation. An encephalocele or spina bifida occasionally undergoes a spontaneous cure by suppuration of the sac, and gradual obliteration of its cavity; and, no doubt, the great success of the operation in the present case was owing to the natural cure having commenced.

"The pathology of the tumour is interesting, as showing—

"First. That although the canal or communication between the sac or cavity and the interior of the cranium may be closed, it may still remain pervious in the pedicle or neck.

"Second. That a distinct process not composed of nervous elements may pass down from the interior of the cranium into the walls of an encephalocele.

"It is, however, possible that this process was originally composed of nervous tissue, which had undergone some change in the progress of the case."

Three cases of spina bifida treated by the injection of iodine, with complete cure in two cases, and in the third probable cure frustrated by the fault of the child's friends, are related by Dr. Caradec ('L'Union Médicale,' 1867, vol. i, pp. 402—467).

Fracture and dislocation of the spine.—In the 'Lancet,' April 6, 1867, Mr. Bryant gives some statistics of injury of the spine, in order to show that pure dislocation is less rare than is usually taught. The cases were collected by Mr. Bryant during five years, while acting as surgical registrar to Guy's Hospital, ending in 1858.

"Out of 46 cases of injury to the spine admitted into Guy's Hospital during that period, there were 24 cases of dislocation, fracture, or both combined. In 10 of these the injury was in the cervical region; in 14 the dorsal.

"In 17 examples the nature of the injury was verified by a post-mortem examination; in 7 no such was made. Our observations will consequently be confined to the 17, in which no source of fallacy can be made out. Of the 17 cases, 6 were examples of *pure* dislocation, 3 of *pure* fracture, and 8 of dislocation and fracture combined.

"Amongst the 10 cases of injury to the cervical region, 5 were pure dislocation; 2 between the fourth and fifth cervical, 2 between the fifth and sixth, 1 between the seventh cervical and first dorsal. Five were dislocations and fractures combined. In each the body of the vertebra was dislocated forwards from the one below; the articular processes were separated at their joints, and in each there was a fracture through the spinous processes or laminæ of the *upper* or dislocated vertebra, the dislocation taking place at the lower surface of the third, fourth, fifth, sixth, and seventh vertebræ respectively.

"It will thus be seen that out of 10 cases of injury to the cervical vertebræ, half were cases of *pure* dislocation, or 50 per cent.

"Amongst the 14 cases of injury to the dorsal region, 1 was a *pure* dislocation between the eleventh and twelfth vertebræ, the ligaments normally connecting all the joints were ruptured, and the body of the eleventh thrown forwards. In 3 the eleventh dorsal vertebra

was dislocated forwards from the twelfth, tearing through the intervertebral substances, and this dislocation was associated with fracture of some portion of the arches of the *lower* vertebræ. The articular surfaces, however, in all the cases were singly or doubly dislocated. Of the 3 cases of fracture, in 1 the fourth and fifth dorsal vertebræ were comminuted; in 1 the eighth, ninth, and tenth were fractured through the bodies and laminæ; and in the 3rd, the twelfth dorsal with the three first lumbar were extensively fractured.

"In all the seven cases in which the nature of the accident was not verified by post-mortem examination, the injury was in the dorsal region, about the tenth, eleventh, and twelfth vertebræ.

"It would thus appear fair to conclude—

"That injuries to the spinal column are more frequent in the dorsal than in the cervical region, but only in the proportion of 58 to 41.

"That in injuries to the *cervical* region pure dislocation of the spine is as frequent as the combination of dislocation and fracture; that in all such injuries the intervertebral substance is torn through, the upper vertebra being, as a rule, thrown forwards; and that where fracture takes place, it is generally at the spinous process, and not in the bodies.

"That in injuries to the *dorsal* region pure dislocation is very rare, although it may occur; that such injuries generally take place between the tenth, eleventh, and twelfth vertebræ; that the body of the superior is generally dislocated forwards, and the body of the inferior is as generally fractured; and that some portion of the arch of the inferior vertebra is, as a rule, broken.

"One word as to the condition of the cord in these cases. In nearly all the cases of dislocation or fracture the injury was complicated with destructive change in its structure; in at least 75 per cent., or three fourths, the cord was irreparably injured and disorganized, either by the primary mechanical pressure of the dislocated bone or by the effusion of blood within its structure."

Scriveners' palsy.—In the 'Lancet' for May 11, 1867, Mr. Solly, in commenting on a case of scriveners' palsy, in which total rest of the hand was followed by a complete cure, thus summarises the conclusions to which his experience of this disease has led him:

"From the number of cases which I have now seen, I am convinced that in a well-established case of this disease—*i. e.* in a case which has been allowed to progress unheeded for some weeks—I have hitherto found that entire rest from handwriting for three months should be insisted on; but if the case is very recent, then I have reason to believe, from the following fact, that a much shorter time would suffice.

"Within the last few weeks I was consulted by a clerk in a bank for a slight numbness in the little finger, an indisposition to write, as he expressed it, or a slight feebleness in writing, with a difficulty in closing the hand. These symptoms had existed five days, and would not have been attended to if he had not seen other of his fellow-clerks struck down by scriveners' palsy. The disease commencing with exactly the same signs, I prescribed at once entire rest, with a sojourn

at the seaside; a teaspoonful of the syrup of the superphosphate of iron and manganese immediately after meals. In a short time—about a week—the numbness decreased, and then passed off entirely; at the end of a fortnight he was apparently quite well again. I suppose that in this case the complaint was correctly diagnosed before any alteration of structure had taken place, and hence the rapid recovery.

"In all cases it is important that the general health should be attended to, and suitable tonics given; but that no strychnine should be prescribed for at least two months after the date when the use of the pen had been first abandoned, and that in no form should galvanism be employed until some improvement can be detected.

"My practical experience so far corroborates my theory of this disease, that in a confirmed case the dynamic portion—*i. e.* the vesicular structure—of the spinal cord or cerebellum, which harmonises the movement of the hand, has been overworked and disorganized; that it must be reproduced in its original integrity; that the cure consists in giving nature time and leisure to effect this reproduction.

"I have no positive facts to bring forward in proof that the nervous centre which has been injured is in the cerebellum or spinal cord, but I still incline to the belief that it is in the spinal cord."

Sciatica from inflammation and effusion in the mouth of the sciatic nerve.—In the 'Medical Times and Gazette,' Jan. 4, 1868, Dr. Fayrer, of Calcutta, relates the case of a gentleman, æt. 30, who had been salivated three months previously for a venereal affection, after which pain in the hip made its appearance, so severe that he was unable to sleep. Blisters and several other remedies, including the iodide of potassium, had been used in vain. The symptoms of sciatica were well marked, and there was great pain in the course of the nerve in the gluteal region, and especially at one point, where Dr. Fayrer thought, after long and careful examination, that he could detect deep-seated fluctuation, with fulness and induration in the course of the nerve. There was also some tenderness on pressing deeply in the iliac region. It occurred to him that there had been inflammation in, and that the symptoms were due to effusion into, the sheath of the nerve. It is to be observed that the patient had been previously a healthy man, and not subject to sciatica or rheumatism. Dr. Fayrer made a puncture with a long narrow knife down to this indurated part, and gave exit to more than half an ounce of clear serum. The removal of tension caused by the fluid was followed by immediate and almost perfect relief.

Dr. Fayrer did not see his patient again, but ascertained, more than a month afterwards, that he was quite well and free from lameness. Dr. Fayrer remarks:

"This is the only case of the kind that I have met with, but I should more carefully look for this effusion within the sheath of the nerve in future cases of sciatica that may come under my observation. It is possible that this may have been due to the attack of syphilis, or to the mercury he took to salivation for its cure. But as there was no other evidence of constitutional syphilis, and as iodide of potassium had no effect on the disease, I am inclined to think it was not traceable to

this specific origin, but that it was the result of simple inflammation of the neurilemma. The relief afforded by the incision was very great, and, from the accounts I have since received, it has been permanent."

Extirpation of a tumour from the anterior crural nerve, together with a portion of the femoral artery and vein. Restoration of the nervous functions, and uninterrupted nutrition of the limb.—In the 'Deutsche Klinik,' 1867, p. 285, Prof. Otto Weber relates a case in which a young man, æt. 27, had suffered for half a year from the growth of a very painful tumour at the middle of the inner aspect of the thigh. The tumour was of variable consistence, shared slightly in one part in the pulsation of the femoral artery, which, therefore, was thought probably to run through it, and lay underneath the sartorius, which was partly united to it. It was about the size of a goose's egg, slightly movable, not very tender to handling, unless this was rather violent. There was acute darting pain, and a feeling of formication abruptly limited by the crest of the tibia. The sensibility of the limb was somewhat diminished, its motor functions undisturbed, except that there were occasional startings of the vastus internus muscle. It was diagnosed as a neuromatous (or sarcomatous) tumour of the crural nerve, involving chiefly the saphenus and the nerve to the vastus internus. As it was growing rapidly, it was at once removed. The sartorius, which was infiltrated, was removed in a portion only of its breadth, leaving its continuity interrupted. The crural nerve was so lost upon the substance of the tumour that the attempt to dissect it out failed. The vessels were exposed and dissected as they reached the tumour. An attempt was made to free the artery from the growth, but its coats were found to be infiltrated, and on attempting to dissect it clean the blood began to permeate the thinned wall of the vessel. It was accordingly tied, but not divided. The vein was found to be penetrated by the tumour, and was also tied close above the mass. Then the vessels were dissected clean below the tumour. This was close to the opening in the adductor magnus. The collateral circulation was found to be so far restored that the artery pulsated strongly. One ligature was placed around both vessels, but before it was tied an opening was made into the artery, and the stream of blood was about as powerful as if there had been no ligature on the upper part of the vessel. Then the ligature was tightened. The tumour was now removed with a portion of the adductor magnus. It is described as a "gliosarcoma," but its precise structure is not essential to our present purpose. The nerve was perceptible above and below it, but was lost in the substance of the tumour. The artery was imbedded in the mass, but its tube was free. The vein, on the contrary, was occupied for about two inches by the growth, though a narrow channel for the blood was still left.

After the operation the leg was colder than the sound leg, and the veins distended, but this difference disappeared in about six days. There was moderate traumatic fever, which, however, ceased in a week, and the patient recovered without any drawback. Immediately after the operation the inner side of the lower third of the thigh and of the

knee, as well as the skin down to the malleolus, were quite devoid of sensation, but this area of insensibility gradually contracted. Seven days after the operation it was limited to the inside of the leg; three months after, to a spot of two square inches in the middle of the shin; and a month afterwards, to only half a square inch.

Prof. Weber refers to some researches of Szymanowsky, in the 'Prager Vierteljahrschrift,' as giving similar examples of restoration of nervous influence after the removal of large portions of nerves. Such restoration must be due either to regeneration of the nerve or to anastomosing branches carrying on the current. In the present instance, as the portion of nerve removed was three inches long, and the functions were restored to a great extent a few days afterwards, the latter explanation is more probable. The patient remained well when last heard of—about half a year after the operation—and could walk fifteen miles.

Wound of the median nerve, with preservation of the sensibility of the skin; exceptional recurrent sensibility.—In the 'Gaz. des Hôp.,' 1867, pp. 529, 555, will be found the account of a case, under the care of M. Richet, in which a woman received a transverse wound, about an inch above the wrist, extending from the radial to the ulnar border of the forearm. When seen, it was gaping to the extent of two fingers' breadth, and was filled with blood. On cleaning it M. Richet discovered the lower end of the radial artery, on which a ligature had been placed, and then the upper end of the same vessel drawn out into a point, and not bleeding at all. This, however, he thought it better to tie. The tendons of the palmaris magnus and parvus ("flexor carpi rad." and "palmaris longus" of our schools), and the tendons of the fl. digitorum sub. which go to the middle and ring fingers, were divided, and some of the deep tendons notched. The other tendons were intact. In searching for the median nerve he found towards the lower lip of the wound a little stump, which he at first took for one of the tendons, but when he took it up with the forceps the patient cried out. M. Richet turned up the stump to examine it, and as it was very irregular he cut a small projecting piece off it. The patient felt sharp pain from the section, and the central artery of the median nerve was seen bleeding. The portion cut off did not include the whole circumference of the nerve, but only a projecting and irregular fragment. Nerve-structure was seen in it under the microscope. He then searched for the upper end, but he continued his search as far as the ulnar border of the forearm without finding it. At length he saw it, pushed aside, folded up, drawn out, and "frayed off," as it were, at its extremity. On taking it up to replace it the patient felt excessive pain, showing that it was really the median nerve. M. Richet wished then to show to those about him the effects of a complete division of this large trunk, but, to his great surprise, the patient retained the power of sensation. She felt quite plainly when touched on the thumb, the middle and ring fingers. In his astonishment he turned again to examine the wound, and again assured himself that the section of the nerve was complete. He then united the two parts of the nerve with

two points of suture, one on the front, the other on the posterior surface, including only the neurilemma. In order to complete this operation he had again to turn back each end of the nerve, which would have been impossible if the division had not been total. The tendon of the flexor carpi radialis was also united, but not the others. It ought to be mentioned that the palmar muscles supplied by the median nerve appear to have been completely paralysed. Three hours afterwards, M. Richet again examined the patient with MM. Pajot and Denonvilliers. Every possible precaution was taken to avoid any impact to the fingers in estimating their sensibility. They were carefully supported while lightly touched with a roll of charpie or a paper spill. The sensibility was found to be intact in the thumb, the middle and ring fingers, and the palm of the hand. In the two last phalanges of the index finger it was very obtuse, and the reporter observed it to diminish still more in this finger afterwards. As to temperature, she was occasionally deceived, sometimes taking a cold object for a hot one, and *vice versâ*, but this, M. Richet says, is common to every person.

M. Richet adduces two other cases, under M. Nélaton's care, in one of whom, during an operation for neuroma at the upper part of the forearm, the median nerve was divided, in the other an accident similar to the above had occurred; and in both, according to M. Nélaton's verbal report, "sensibility persisted after the section of the nerve, before any suture was applied to it." In a third case, under M. Laugier's care, sensation had reappeared some hours after the suture. and M. Richet doubts if it had ever disappeared. In order to account for this preservation of sensibility after the complete section of the nerve (which he believes would be found to be the normal condition), M. Richet, in the first place, distinguishes between the two phenomena observed in this patient. The sensibility displayed by the distal fragment of the nerve—"recurrent sensibility"—may, he thinks, be attributed to the "nervi nervorum," and he supports himself in this by the opinion of M. Robin and M. Onimus. As to the tegumentary sensibility, he adduces a theory of M. Robin, who believes that the nervous filaments distributed to the tactile corpuscles derive their origin from terminal loops, which would, in the instance before us, be attached on one side to the median, on the other to the radial nerve. M. Robin has followed under the microscope the filaments proceeding from these loops, and seen them very clearly. They have a diameter of about the 1-10th of a millimètre, and pursue a course of 4 to 10 millimètres before terminating in the tactile corpuscle. According to this theory, each terminal sensory filament being attached to two nerves, the preservation of the function of touch would be much more secure. Other explanations of M. Richet's case might be adduced, as that the peservation of sensation was due to the palmar cutaneous branch, which might be supposed to be left intact, and that this palmar cutaneous branch also furnishes sensation to the nerve itself, and thus accounts for the recurrent sensibility. Only this hardly explains the preservation of sensation in the fingers. Other explanations of the sensation in the fingers, as by attributing it to anastomoses with other nerves, or to a

supposed anomaly in the distribution of the nerves in this patient, do not account for the recurrent sensibility.

The notes of the case extend over about eighteen days. The sensibility became gradually more exquisite, and hyperæsthesia had come on in the thenar eminence, with formication and intermittent pain in the fingers. On the eighth day electricity applied by M. Duchenne failed to excite any contraction in the muscles of the thenar eminence.

In the 'Lancet,' Aug. 1, 1868, p. 142, is the account of a case by Mr. Savory, which may be compared with the foregoing case of M. Richet. Here a large neuroma existed on the musculo-spiral nerve. The tumour was removed, and along with it a portion of the whole thickness of the nerve, several inches in length. The operation was followed by complete paralysis of the muscles which are supplied by the nerve, so that the muscles of the back of the hand were paralysed, and the hand dropped forward from the wrist. But in testing the sensibility of that portion of the skin of the hand which is supplied by branches of the radial nerve, Mr. Savory was not a little astonished to find that it was but slightly impaired. Details are given proving how little difference of sensation there was between the dorsal and palmar surfaces of the hand, and also that the radial portion of the dorsum was rather more sensitive than the other half. This remarkable fact is only to be explained (since there is no other cutaneous supply to the parts in question, except through the nerve of which some inches had just been removed) by supposing that the anastomosis between the external cutaneous and the radial, which takes place by means of a few filaments passing from the former nerve to the latter just above the wrist, was sufficient to impart its power of receiving sensation to the radial when thus isolated. Mr. Savory thinks that the communication between the ulnar and radial, on the back of the hand, is too near the distribution of the nerves to account for the phenomenon. The case suggests to him the question whether nerves are so isolated in their distribution as they are now believed to be, or whether the purpose of the communication between different nerves in their course is not more extensive and complete than has been hitherto recognised.

In a paper entitled "An Outline of the Present Methods of Diagnosis in Aural Surgery," in the 'Medical Times and Gazette,' Aug. 10, 1867, Mr. Hinton makes the following observations on the relation of diseases of the ear to diseases of other organs, or to general morbid conditions:

"On this point I have to confess that my inquiries have yielded as yet, with a few important exceptions, a somewhat negative result. I think, indeed, if I expressed my own feeling on the matter, I should say a strikingly negative result. Scrofula, as is well known, in children predisposes to inflammatory affections of the meatus and tympanum, and renders a fatal extension to the bones more prone to ensue. Gout has occasionally one of its seats in the external meatus, and apparently another in the articulations of the ossicula, which small joints appear sometimes to suffer from a true arthritic anchylosis. The connection of this condition with a rheumatic diathesis may be more frequent, but

appears to me to be less clearly marked. Acquired syphilis is a direct cause of deafness in a certain, not very large, number of cases; and hereditary syphilis, as pointed out by Mr. Hutchinson, sets its stamp unmistakably on a number much more considerable. Persons prone to eczema and psoriasis are especially liable to certain chronic inflammations of the meatus, and those in whom there is a tendency to engorgement of the mucous membrane of the throat, of course suffer most from obstruction of the Eustachian tube.

"But besides these groups of cases I have been able to trace scarcely any instances of a clear connection of disease of the ear with other general or local diseases. Deafness often runs in families; and a general exhaustion and irritability of the nervous system is sometimes seen to accompany a special inability to hear without discoverable lesion of the conducting apparatus. But this is by no means always the case. I should say that the rule is the contrary, and that what we must still be content to call 'nervous deafness' does not generally coincide with other symptoms of nervous derangement. At the same time, there appears to be a certain constitution of body with which a nerve-deafness is often associated; so much so, that on the first aspect of the person his or her symptoms may be pretty accurately predicted. These patients may be of either sex, but are more frequently females; they are characterised chiefly by a peculiar smoothness of the skin, giving to the features, when it is extreme, something of a drawn aspect. There is, however, no emaciation; they appear to be in perfect health, often robust, and by no means complain of weakness. They seem mostly of the sanguine or nervo-sanguine temperament, and the countenance is more or less florid. They give no history of mental shock or physical exhaustion, and the other senses, as a rule, are not impaired. In one such patient, however, now under my care, a girl of 16, the sight is weak, and ophthalmoscopic examination (for which I have to thank my friend Mr. Bader) reveals an extreme hyperæmia of the optic nerve and retina. In this case the symptoms are those of increased pressure within the labyrinth—a glaucoma of the ear. The coexistence of aural and ocular disease in this case is interesting, but I have met hitherto with few parallel instances. One case of confirmed glaucoma, accompanied by total deafness, I had the opportunity of examining after death, and found softened patches in the brain and degeneration of the membranous labyrinth, together with extensive disease of each meatus, the bone being largely absorbed by the pressure of accumulated masses of epidermis. Unfortunately, as yet, our means for measuring excess or deficiency of the labyrinthine fluids after death are scarcely reliable, though I think I have met with both.

"Apart from syphilis I have not found ocular and aural disease to be general concomitants, though the frequent existence of myopia in patients suffering from deafness not referable to derangements of the conducting media of the ear—a fact for which I am also indebted to the kind offices of Mr. Bader—suggests, perhaps, a glimmering of light, and affords a clue for future research. I have never been able to connect loss of hearing with albuminuria. But I have seen cases which support the idea of an injurious influence of tobacco—I mean on the

function of the nerve, apart from its debilitating influence on the throat."

Removal of foreign bodies from the ear.—In the 'Med. Times,' i, 1868, p. 261, the following method is recommended for this purpose, on the authority of Mr. Hutchinson's practice, as eminently successful, and little likely to do any harm. Let the surgeon take six inches of fine wire and double it into a loop; then, having the patient placed on his side, pass the loop into the ear as far as it will go, and turn it a little gently. At the first or second withdrawal the foreign body will come out in the loop.

The following extracts refer to affections of the organs of circulation:—

Bullet-wounds of the heart.—In presenting to the New York Pathological Society a heart in which a rifle-ball had been imbedded during twenty years in the wall, Dr. Hamilton stated that Dr. S. S. Purple, in a paper on wounds of the heart, published in the May number of 1855 of the 'New York Medical Monthly,' reported twelve examples of gunshot wounds of this organ, in which the patient lived fourteen days with a ball in the pericardium. Dr. Hopkins, of Ohio, has reported a case in which the patient survived fifteen days with a pistol-ball encysted in the wall of the left ventricle. Carnochan's patient, the notorious Poole, lived eleven days with a pistol-ball encysted in the walls of the heart. In the case reported by Dr. Randall, of Ohio, the patient died on the sixty-seventh day, and three shots were found in the right ventricle and in the right auricle, the wounds having cicatrized. In the 'Indian Annals of Medical Sciences' a man is said to have survived ten weeks with a musket-ball in the cavity of the left ventricle. Fournié records the history of a man who, wounded by a ball, fell as if he were dead. Three months afterwards he suffered from severe palpitations, which nearly disappeared after three years. He died six years after the receipt of the injury from some malady unconnected with his injury; and the ball was found lodged in the right ventricle, near the tip, and resting on the septum medium. ('Brit. Med. Journal,' March 23, 2867.)

Wounds of the internal jugular vein.—Dr. S. W. Gross arrives at the following conclusions from the study of eighty-five recorded cases:—1. Incised and punctured wounds of the internal jugular vein are to be classed among the most fatal of accidents; and, if subjected to no treatment, are invariably mortal from primary hæmorrhage, the introduction of air, pyæmia, or secondary hæmorrhage. 2. Gunshot wounds of the vein alone are always fatal from primary or secondary hæmorrhage, or pyæmia. 3. When the carotid artery is opened at the same time, either as a result of gunshot, incised, or punctured wound, the case may, under favorable circumstances, recover, but with the formation of an arterio-venous aneurism. 4. Compression is followed by a fatal result as often as ligation, is more painful and inconvenient, and is to be resorted to in those cases only in which a thread is inapplicable from the high situation of the wound, or when the vein is

merely punctured, and the measure can be applied mediately. 5. Ligation is more convenient, as it produces neither pain nor a suppurating cavity; and the fears of exciting diffused phlebitis are utterly groundless, as there is not a single example showing that such an inflammation has followed its employment. The ligature is, moreover, called for to guard against the introduction of air, and prevent its further ingress, as well as to prevent the occurrence of diffused phlebitis. 6. The lateral ligature is to be avoided, as it has been the cause of all the fatal results from secondary hæmorrhage; and both ends of the wounded or divided vessels are to be tied, since reflux hæmorrhage is not an infrequent occurrence. 7. Ligature of the common carotid artery will not restrain the flow of blood from a wounded internal jugular vein, and is, therefore, to be rejected as a hemostatic measure. 8. Not only has the danger of pyæmia after ligation of the vein been greatly exaggerated, but all the dangers are also hypothetical, as neither apoplexy, softening of the brain, nor other cerebral disorders, have ensued from its employment, the collateral circulation being amply sufficient to prevent those accidents. 9. The cause of death after ligation is not to be looked for in the production of pyæmia, as the fatal issue has, in every instance, been due to secondary hæmorrhage, coming on about the time of the separation of the thread. ('American Journal of Medical Sciences,' quoted in 'Brit. Med. Journal,' July 13, 1867.)

The Hunterian ligation of arteries to relieve and prevent destructive inflammation. By Henry F. Campbell, M.D., Professor of Anatomy in the New Orleans School of Medicine, and during the war Consulting Surgeon to the Georgia Hospitals, Richmond, Va.

The above is the title of a short pamphlet published at Augusta, Georgia, in 1866. The author refers to a paper which he published anonymously at Richmond in October, 1863, and to a manual on operative surgery for the use of the army surgeons of the Confederate States, in one of the chapters of which the same subject is discussed. The present pamphlet is meant to explain the views expressed by Dr. Campbell in these two previous publications, and to give notes (as far as it was possible to preserve them) of the cases on which those views were founded. The following is the author's explanation of his previous teaching:

"The method of ligation proposed, or rather revived, by Mr. Guthrie, is advocated throughout our chapter for nearly all cases of traumatic hæmorrhage, whether primary or secondary, while that of Hunter is strongly objected to. Certain exceptional cases, however, are discussed, wherein it is taught that Guthrie's double ligature at the seat of injury may be advantageously replaced by the method of Anel and Hunter, in which a single ligature is applied at some distance above the arterial lesion. The most prominent among the exceptional conditions is the one—everywhere dwelt upon—wherein the condition of the wound, and of the limb, was such as to indicate a liability to extensive or even destructive inflammation. In such cases our experience and observation, very early in the war, had taught us that the risk of hæmorrhage by the re-

current circulation was not to be weighed against the great advantage of curing, or at least controlling, the inflammation—indeed, saving the limb and the life—by the ligation of the main arterial trunk which supported this inflammation."

Thus it will be seen that Dr. Campbell's proposal refers exclusively to cases of hæmorrhage, and that he teaches that in cases of secondary hæmorrhage after gunshot, when the parts around the wound are much inflamed, the Hunterian ligature will in many cases avail, both to check the bleeding and subdue the inflammation. The following statement of the results of his practice puts this clearly before the reader. The extract is a reproduction of Dr. Campbell's remarks in the 'Manual of Military Surgery' above referred to.

"After the battle of Seven Pines, May 31, 1862, many of the wounded in the General Hospital at this place (Richmond, Va.) suffered from the most violent and uncontrollable inflammation. The inflammation from gunshot wounds, for sufficient causes, viz. the shock or jar to all the tissues, especially the nerves and blood-vessels of the part, is apt to be more intense than in other wounds of the same parts. Wounds of both the upper and lower extremities resisted all ordinary measures of treatment. Suppuration in many cases had ceased, and in its place a bloody water was discharged from the openings and abrasions. The swelling in these cases was immense.

"Six of the above cases* under our observation were the subjects of arterial lesion. The arteries wounded in the lower extremity of three of these cases were severally—in one, the peroneal close to its origin; in the other two, the anterior tibial, near the middle of the leg. Profuse secondary hæmorrhage occurred in all these cases, respectively, on the fourteenth, twelfth, and tenth day. Ligation was determined on. The extreme swelling and inflammation of the limb, extending even above the knee in all, and in one marked by large patches of incipient gangrene on the foot, presented great embarrassments to the operation at the seat of lesion. It was not the difficulties, however, which caused Mr. Hunter's operation to be preferred in all of these cases to Mr. Guthrie's, notwithstanding the risk of recurrent hæmorrhage. There was a desirable incidental benefit hoped to be attained, which was of even deeper interest, if possible, than the arrest of the hæmorrhage. The idea pursued, in departing from the rule, was no less than the experimental effort to cure the inflammation in the limb by cutting off its arterial supply, by ligation of the main trunk which supported the inflammation. The femoral artery was tied in each case near the apex of Scarpa's triangle. The hæmorrhage ceased immediately in all three of the cases, the swelling began to decline within twelve hours, and in three or four days the limbs were reduced to very nearly their natural size, the discharge having changed from bloody water to healthy pus.

"*Results.*—Case 30 (J. M. Orr, of present paper), recovered slowly, on account of the sloughing out of the patches of gangrene, which had shown themselves previous to the ligation. These surfaces granulated

* See Reports of 1st, 2nd, and 4th Georgia Hospitals, in office of Surgeon-General—Ligation of Arteries.

healthily and cicatrized firmly. The suppuration was profuse and long-continued.

"In case 33 (Drury B. Early, of present paper), the result was most satisfactory and complete; the swelling had disappeared in three days —the appearance of the wound wonderfully improved—the discharge became healthy, and the subsequent progress of the case rapid and favorable, ending in entire recovery.

"In case 32 (S. A. Willingham, of present paper), it was discovered, after the complete subsidence of the swelling, that the fibula was broken. Still the case progressed well. The inflammation was entirely subdued. On the tenth day after the ligation recurrent hæmorrhage supervened, causing great infiltration below the knee in the popliteal space, and rupture of the nearly cicatrized gunshot wounds. This patient was greatly exhausted, and was not thought to be able to bear the ligation of the peroneal artery. Amputation above the knee was determined on. Only one artery, superficial and of small size, required tying in the stump. It is worthy of remark that the stump healed by the first intention—a most unusual result of a secondary amputation. It is not unfair to presume that the previous ligation favoured this rapid recovery of the stump.

"In the three cases of arterial lesion in the superior extremity, in which ligation of the main trunk in its continuity was preferred, in order to subdue inflammation, the arteries wounded, respectively, were the brachial near the elbow in one, and the radial in both the others. The inflammation was greatly modified, though not in so marked a manner—except in one of them—as in those of the lower extremities. The patients all recovered; and in two of them recurrent hæmorrhage took place, but was controlled without resorting to further ligation. In the exception mentioned no recurrent hæmorrhage occurred, and the inflammation seemed to be completely strangulated throughout the hand and forearm by the ligation of the brachial artery.

"It will be observed that in the above six cases, in which the rule of Mr. Guthrie was departed from, recurrent hæmorrhage took place in three of them, but only in one in such degree as to require an operation. The advantages gained in departing from the established rule would be more apparent from a detail of the cases than in the above very condensed notes. The cases are referred to more in illustration of the circumstances in which departure from the rule may be considered justifiable, than with any view of advocating the Hunterian practice in opposition to the more reliable one of Mr. Guthrie.

"And lastly, though there are, doubtless, many other considerations which may justify the ligation of an artery in its continuity in the treatment of hæmorrhage, we will refer to but one more. For instance, suppose a patient in a state of extreme exhaustion, whether from hæmorrhage or other causes:—Consecutive hæmorrhage in some inaccessible artery, for instance, as the peroneal or posterior tibial high up, occurring in a patient of this kind, especially if complicated with great tumefaction and consequent change in the histology of the parts, would present a case, even for the most practised operator, of unavoidable delay. A prolonged and trying—we had almost said blind—search

among clots and fibrinous masses and condensed infiltrated tissues, every one who has tried it knows full well, is sometimes the only route to the open mouth of the bleeding vessel in such cases. This greatly exhausts the strength of the patient, and lessens—indeed destroys—his chance of life. Under such circumstances the Hunterian operation would be preferable, especially in a wound of the lower extremity. In the first place, it arrests the hæmorrhage for the time being, at least, and affords a *chance* of even permanent arrest; and secondly, by cutting off the main stream from the support of the inflammation and general turgescence, the condition of the limb may be so improved that, in case the recurrent hæmorrhage should take place, a less embarrassing state of things will attend this more desirable operation. The adoption of the one operation gives a chance for life; we think we have seen the adoption of the other, under just such circumstances, take it away." ('Manual Military Surgery,' p. 106.)

"In addition to the above abstract from the text of the chapter referred to, we introduce here the following, found in pages 104-5, as containing pertinent and direct records of our opinion, as well as *facts* relating to the subject:"

Note.—"As the subject has only a relative bearing on the main object of the present paper (hæmorrhage), attention is called, only in a note, to the above practice of ligation to subdue or control inflammatory action. We believe that the cases of Privates C. A. Reid and Drury B. Early, ligation in one, June 5, in the other, June 11, 1862, are the first cases on record in which this measure was adopted with reference to the proposed result. In all of the six cases the Hunterian operation was chosen with the distinct end in view of combating and checking, if possible, the destructive progress and, in some, the septic tendency of the inflammation. In all of these, the pain the swelling and turgescence, were almost immediately relieved, and the most remarkable change was soon presented, as seen in the character of the discharges.

"Surgeon A. C. Thom, of the Confederate States Army, has kindly furnished us notes of a case in which he subsequently adopted the Hunterian ligation of the femoral, and in which the beneficial results were exhibited in the most marked degree—'the inflammation relieved, as by magic.'

"The application of the ligature in cases of elephantiasis, and for malignant diseases of the face, does not, it appears to us, interfere with any originality which the principles here practised may possess. The present operations, besides being applied with an entirely different object, fully answered the proposed end, while the others did not. We feel confident that this practice will become one of frequent application in the treatment of otherwise unmanageable inflammation, under a variety of circumstances authorising its adoption."

The pamphlet then proceeds to give *in extenso* the notes of four cases of ligature of the femoral artery, adopted with a view of controlling hæmorrhage, and at the same time of checking inflammation. That Dr. Campbell, however, had been led by his experience of ligature in hæmorrhage to regard it as a curative measure in inflammation for other causes, the following concluding sentences of his paper clearly show:

"Lastly, whether the principle be adjudicated as a new one, or simply as the revival of an old one, long lost and unjustly neglected, we derive, as a practical deduction from our cases, corroborated and confirmed by subsequent cases of others herein mentioned, the ever-safe conservative precept, that no hand, wrist, forearm, or elbow; no foot, ankle, leg, or knee, should ever be amputated for excessive or destructive inflammation, especially those cases resulting from traumatic causes—without resorting, whenever the state of the patient will admit of it, to a previous experimental ligation of the artery supplying the affected region.

"In extremities already condemned to amputation, if time be allowed, the procedure can certainly do no harm; on the other hand, it will often save a useful limb, or at least contribute to a more rapid healing of the stump."

In the 'Gazette des Hôp.,' 1867, p. 114, will be found a case under M. Nélaton's care in which compression of the brachial artery was used with apparent good effects in inflammation of the hand, after a lacerated wound necessitating amputation of a finger.

In the 'Gazette des Hôp.,' 1867, p. 545, Signor Vanzetti relates a case in which he was summoned to a man with acute inflammation of the hand, after a wound inflicted in extracting a calf. The patient was in a state of great prostration and fever; and everything became changed, the local condition became healthy and the general state much improved by 24 hours' continuous compression of the brachial artery. This was followed by complete recovery.

In the same journal, p. 557, will be found a case by the same author of cure by digital compression in a case of malignant pustule of the hand.

The following strong opinion of Neudorfer, given in a report on the surgical diseases of the garrison of Prague, is quoted in the 'Lancet' for Dec. 7, 1867:

"In the external idiopathic inflammations, and in those which follow operations, we have entirely abandoned the ordinary antiphlogistic treatment—bloodletting, calomel, nitre, &c.; and, as a unique treatment, we have employed only the digital compression. Tried in over 100 cases, we have acquired the conviction that it surpasses in efficacy every other treatment; the heat, the redness, the pain, are removed soon, even in employing only intermittent compression. Thus the digital compression proposed by Prof. Vanzetti is ever acquiring more confidence and credit. We believe that we ought to recommend it very warmly. It serves, moreover, in many cases, to diminish very copious purulent secretions."

The 'Lancet' also reported a case of severe traumatic inflammation of the hand, under the care of Mr. Moore, at the Middlesex Hospital, in which the compression of the artery was procured by acupressure. The treatment here was quite successful.

In a letter to the 'Brit. Med. Journ.' Mr. Maunder speaks as follows:—"Twelve months ago I proposed the application of a ligature to the superficial femoral artery to check acute inflammation of the limb following wound of the knee-joint. The operation was performed with

immediate and continuous benefit, and the patient recovered. I need scarcely say that at that time I believed the suggestion to be original, and have only now been undeceived by the perusal of a short paper upon the subject in the 'American Journal of Medical Sciences' of April, 1868. It there appears that the femoral artery was ligatured, first, for wound of the knee-joint by H. U. Onderdonk, M.D., in the year 1813, and occasionally since that date also in America."

Digital compression of the femoral artery in elephantiasis.—In the 'Gaz. des Hôp.,' 1867, p. 592, Signor Vanzetti relates a case in which he employed digital compression of the femoral artery with complete success, for "elephantiasis" to a slight degree, the result of frequent attacks of erysipelas of the leg. In order not to confound the effects of compression with those of simple rest and bandaging, the patient was confined previously to bed for three weeks, and the limb carefully bandaged. As this produced no change, digital compression of the artery was carried on during the day for a few days with great improvement, and finally, after some irregularities, occasioned by his condition of health, a complete cure was effected by a combination of intermittent digital pressure and starch bandage. The skin became rather more delicate than that of the other leg, and the elephantiasis had completely disappeared when the patient was seen three years afterwards.

Digital compression in aneurism.—In the 'Gaz. des Hôp.,' 1867, p. 505, will be found the account of a communication made by Sig. Vanzetti to the Soc. de Chir. This communication contains a detailed account of the following cases:—(1) A traumatic aneurism of the superficial palmar arch, from a wound received six weeks previously. The patient, a man, æt. 44; the wound had been treated by compression, and was cicatrized five days afterwards, and a week after this the man returned to his work in the fields. Soon the aneurism showed itself, and as it began to increase rapidly, and became painful, he reapplied the compression with considerable force. This, however, caused ecchymosis of the skin; he became alarmed, and came to the hospital at Treviso. The tumour then presented all the classic signs of aneurism. Dr. Vecelli, under whose care he was, set himself to compress the brachial. He did this, not very rigorously, for half an hour, and at the end of that time found the tumour had lost its pulsation and bruit, and was already solid. As a precaution, the pressure was continued for a quarter of an hour more. Then the arm was put in a scarf, and the patient ordered not to move it. He left the hospital in a week, and was seen quite well a month afterwards. (2) A spontaneous aneurism of the femoral artery just above its passage through the adductor magnus, cured by complete and continuous digital compression for ten hours on the femoral in the groin. (3) An arterio-venous aneurism of the bend of the elbow, the result of a bleeding ten days before. All the symptoms well marked. Cure was effected, though after a considerable time (sixty days), by indirect compression of the brachial artery, with direct compression on the basilic vein. The compression was digital at

first, and appears to have been so throughout. After sixty hours of continuous compression (as far as the account is intelligible) the venous bruit and thrill ceased, and the case became one of simple aneurism. Then compression was made on the brachial, as well as could be managed, about eight or ten hours a day, and the patient became gradually cured.

On direct compression in the treatment of aneurism.—In the 'Annali Universali di Medicina,' 1867, 199, p. 351, Dr. Ciniselli treats of the use of direct compression in the cure of aneurism. He commences by referring to cases already published, as follows:

(1) Cure of a case of traumatic aneurism at the root of the left carotid artery, the size of an orange, by direct compression maintained on it by means of the bottom of a tumbler filled with ice. Internal regimen calculated to diminish the heart's action was also used.—Sonchier d'Allex, in the 'Atti della Soc. di Medicina di Marsiglia,' quoted in the 'Annali Universali,' xciv, 1840.

(2) Traumatic aneurism in the groin extending into the pelvis. Indirect compression on the iliac artery, followed by direct compression with the patient's own hand on the tumour.—Rizzoli, 'Bulletino delle Scienze Mediche di Bologna,' xxi, 1864.

(3) Popliteal aneurism of large size gradually cured by direct compression in about a month by the same surgeon.—Ibid., xxiii, 1865.

(4) Bellingham's case of secondary aneurism of the external iliac recurring after ligature of the common iliac, and cured by compression first below the tumour, then on the tumour itself.—Brosa, 'Des Anévrysmes,' p. 889.

(5) Popliteal aneurism treated by compression with tow steeped in white of egg mixed with Bol. Armenian and alum, assisted by bandaging the limb. Cure in two months.—Fabris, in 'Ann. Univ. di Med.,' xxviii, 1823.

(6) Gherini relates a case of popliteal aneurism in which the patient effected his own cure by means of a bandage which he had applied to relieve the pain he felt in walking.—Ibid., Nov. 1858.

(7) Gherini also relates a case of varicose aneurism after bleeding, in which he used first indirect compression to the brachial, then direct compression on the tumour; and observing that the tumour became smaller and harder under the latter, he persevered with the direct compression, which in a short time effected a perfect cure.—Ibid., March, 1864.

(8) In a case of traumatic axillary aneurism under his own care, occupying the whole cavity of the axilla, indirect compression of the subclavian for a quarter of an hour once or twice a day was used, and the tumour compressed by means of a sponge maintained continually in position with a bandage. The cure was complete in four and a half months, and remained permanent.—'Bulletino delle Scienze Mediche di Bologna,' xxiv, 1865.

In all the above cases, however, either other means were used as well as direct compression, or the means and degree of compression are not related with sufficient accuracy.

In order to obtain all the benefit of this method of treatment, he prescribes that the compression should be made by means of a soft elastic body, embracing as far as possible all the free surface of the tumour, and compressing it continuously but moderately, and only to such an extent as is necessary to reduce it to a quiescent condition, by suppressing the movement of expansion, which causes the disruption and progressive dilatation of the parietes of the tumour, and thus favouring the organic contractility of those parietes by means of which the tumour is gradually reduced in size and disappears.

In illustration of the application of this treatment he gives two cases, one under the care of Brunker in 1839, and related in the 'Brit. and For. Med.-Chir. Review,' Jan. 1840. In this case a popliteal aneurism ceased to pulsate after compression for five days with a sponge bandaged on to the tumour. No other treatment was used, the patient being in bed on low diet. The sponge was kept on the tumour as a precaution for about a month longer. Cure was complete.

The other case was under his own care. It referred to a case of traumatic aneurism of the carotid artery, which had been treated without success for three weeks by digital compression of the vessel below the tumour. Treatment was commenced by bandaging a large piece of soft sponge on to the tumour, tightly enough to suspend the pulsation of the tumour, though not to diminish its size. The bandage was so arranged as not to press on the opposite artery, and the pressure was intermitted for a few hours at night. The sponge was wetted once a day to give it the requisite elasticity. He was allowed to be out of bed, with good diet and wine. In twelve days there was a sensible improvement, so the proposal to tie the carotid was negatived. After ninety-seven days of compression the tumour was indurated, and had lost all pulsation of its own, though the carotid remained pervious and imparted its pulsation to the tumour. The patient was now attacked with confluent smallpox, and was in great danger of his life. On his recovery the aneurism was found to be perfectly cured, and the permanence of the cure was ascertained by seeing the man about a year afterwards.

Cold in the treatment of aneurism.—In the 'Med. Times and Gaz.,' Feb. 29, 1868, Mr. Harrison, Assistant-Surgeon to the Royal Artillery, relates a case of popliteal aneurism, in which he experienced much aid to the action of pressure upon the femoral artery from the local use of cold, applied by means of the ether spray to the tumour. The pressure was instrumental. On the first occasion the pressure of the instrument was too severe, and after an hour and a quarter it was replaced by digital pressure, which was kept up for about a day and a half. The ether was used for twenty minutes during this period, and after its use it was thought that the tumour was solidified, but it gradually recurred to its former condition. A better compressor was procured and applied at 3 p.m. on Jan. 29, compressing the artery just above Poupart's ligament, and alternated carefully with the stiff instrument before in use, and the ether spray sufficient to freeze the surface of the tumour every half hour. There was not the slightest pulsation on removing

the pressure at 4 p.m.; it was kept up for twenty-six hours, viz. until 6 p.m. on the 30th—no pulsation having been detected for twenty-five hours. There was no distress or constitutional disturbance, and the tumour was hard and small like a racket ball and without pulsation. He was directed to maintain the limb in a semi-flexed position for some days, and to keep as quiet as possible. On examining the case on Feb. 15, the aneurism was found to be completely cured, and the collateral circulation effected. The limb is in every respect equal to the other, and the tumour has been reduced from the size of a small orange to that of a walnut, and is quite hard, so that the case may be looked upon as successful.

Treatment of aneurism by complete arrest of the circulation.—In the 'British Medical Journal,' Oct. 5, 1867, will be found the report of a most interesting discussion which took place at the Surgical Section of the British Medical Association at Dublin, on the presentation of two papers, by Dr. Mapother, of Dublin, and Dr. Murray, of Newcastle-on-Tyne, on the rapid cure of aneurism by completely arresting the current through the sac by means of pressure. Dr. Mapother refers shortly to two cases, one of ilio-femoral aneurism, reported in our last Retrospect, p. 306; and the other of popliteal aneurism, cured (after three unsuccessful attempts without chloroform) by complete compression of the femoral under chloroform for 97 hours, the flow of blood out of the sac being impeded by tight bandaging and elevation of the leg, distal pressure on the popliteal not being possible. Dr. Mapother adheres to his views stated in our previous Retrospect, viz. that the blood should be detained in the sac as completely as possible by complete compression of the artery above and below it, holding that the cure is effected by the coagulation of the blood *en masse*, and not by laminated coagulation.

Dr. Murray supports the same view, and insists on the necessity of excluding every, even the slightest, current of blood from the sac. When this is done cure may be obtained in so short a space of time as to prove conclusively that it could not have been effected by lamination of fibrine.

"At Newcastle a case of aneurism of the abdominal aorta underwent the process of cure in three quarters of an hour; and, in another case at Sunderland, under Dr. Heath's care, consolidation was distinctly observed to occur within twenty minutes. In the Newcastle case unsuccessful efforts had been made for four hours; and, at the end of that time, the aneurism remained unchanged. As neither increase of solidity, diminished pulsation, nor decrease in size, could be detected, I determined to make a final effort. The patient being fully under the influence of chloroform, I reapplied the tourniquet, and held it firmly and securely over the aorta so as to obliterate every trace of pulsation. By a prolonged effort, three fourths of an hour passed without a single slip of the instrument. It was then removed, and the aneurism had ceased to pulsate. A slight movement was perceptible for some time afterwards; this being an impulse communicated from the pulsation of the aorta above it.

"In Dr. Heath's case the pressure had been kept up irregularly for about ten hours, when the patient fainted under the chloroform. The pressure was then removed, and the pulsation and other characters of the aneurism were found to be as bad as ever. The patient was then urged to bear a final effort without chloroform. This he did; and to our amazement, when, at the end of twenty minutes, he declared he could bear the pressure no longer, we found the aneurism had become solid and had ceased to beat.

"Here, then, are two cases in which the actual process of cure was brought about in less than an hour. How is this effected? We affirm by coagulation of blood in the sac of the aneurism. We believe this, because of the short time occupied in bringing about a sudden and decided change in the disease. It seems to me impossible that fibrine can be so rapidly deposited from the blood in such quantities as to fill up the cavity of a large aneurism, and to change a pulsating, thrilling, and expanding sac, into a motionless solid mass. This opinion is supported by another important fact—the large soft mass which is produced by the filling of the aneurism with solid matter disappears in a few hours. In each of the above cases all trace of the aneurismal tumour was gone before we could obtain a plaster cast of the part. Rapidity of disappearance, then, as well as rapidity of production, is in favour of the existence of coagulation of the blood. In it we have contraction of a clot of blood inside the aneurism, by which the watery parts of the blood are squeezed out and absorbed, such as occurs in a clot of blood outside the body."

For several other interesting points touched on in the discussion, we must refer to the original.

In the 'Medical Times and Gazette,' Nov. 16, 1867, Mr. Lawson Tait makes some remarks intended to show the advantage of completely interrupting the current through the sac. After observing that the old surgeons failed in the treatment by compression from using means which the patient could not tolerate, he proceeds to say:

"Compression has failed in our day for this reason to a great extent, but also for another—that the impression exists that only a diminished circulation through the tumour is required to *laminate* the clot and fill the sac. That this may be the case in some few instances is probable, but to lay it down as a general rule seems to me little more than the statement of a theory unsupported by facts. The old statement that aneurisms were sometimes spontaneously cured by the pressure of the sac on the artery is now generally regarded with great suspicion, if not absolutely disbelieved, while we know that the sudden and perfect obstruction to the circulation through a sac, whether accidentally or by means of the ligature, generally effects a cure. It follows, therefore, from these premises that, *cæteris paribus*, if a vessel be occluded as suddenly and effectually by means of some external pressure which could be borne by the patient for the same time that it is necessary for the coagulation of the blood in the sac when the ligature is used, the success of the pressure would be equal to that of the ligature, and greater than it by the difference of risk involved in the disuse of the knife. Again, we have the opinion of one well worthy of attention,

Mr. Henry Lee, that the lamination of the fibrin has as much to do with the increase of the tumour as it has to do with its cure, that each fresh layer merely adds greater leverage power to the force of the blood in enlarging the diameter of the tumour, and that the cure takes place only when a bridge of fibrin is formed over the aperture of the sac. This bridge of fibrin would, of course, be only the last of the laminations; but this view of the pathology of the cure of an aneurism affords a very strong reason for the use of a pressure that will perfectly obstruct the flow of blood into the sac.

"The first and most important condition, as it seems to me, is that the circulation should be at once and thoroughly interrupted for a period sufficient for the firm coagulation of the blood in the sac. To effect this, the galvano-puncture of Pravaz is utterly futile, and even were it not so, nothing would ever induce me to countenance its use in another case. In one case, where I assisted to kill the patient by its means, the fatal result was caused beyond doubt by the evolution of gases from the decomposition of the water of the blood. The introduction of heated needles or of injections of iron may induce rapid occlusion of the sac, but they are just as likely not to do so, and they are apt to induce inflammatory action. The condition will be best obtained either by pressure or the ligature, and the patient's chance of recovery will be greatly increased if it can be done by the former. The form of pressure which is best suited for the purpose is undoubtedly that of the fingers of trained assistants. But, as Mr. Bryant has most correctly stated, few can keep up an adequate pressure for more than ten minutes at a time, and in ordinary practice it is utterly impossible to obtain the number of assistants requisite to keep the obstruction uninterrupted. All the instruments for compression which I had tried and seen tried previous to Mr. Reade's were so irksome that they could be borne for no length of time. The plan by flexion I have tried, and should say of a man who had his aneurism cured by it, that he had powers of endurance beyond anything else I know. I have tied up my own leg and the healthy legs of others, and I have not seen one yet that could stand it an hour, while the three men with popliteal aneurism, in whom I have seen it tried, always let down their legs within ten minutes after they were put up."

Mr. Lawson Tait then proceeds to describe and figure Mr. Reade's instrument, and to relate a case of popliteal aneurism which was cured by its application. The symptoms disappeared after four hours' use of the instrument, which, however, was allowed to remain for about a day afterwards. The instrument is thus described:

"The compressor which obtained such a signal success in this case was devised by Mr. Reade, of Parliament Street, Dublin. It consists of a circular pad, from which radiate a steel spring and 2 straps. The pad is placed on the back of the thigh or buttock; the spring loosely encircles the thigh, passing under the perinæum; the strap passes over the ilium of the unaffected side, to steady the apparatus; the strap passes over the ilium of the affected side also, aiding materially to steady the apparatus, but having for its principal object the exertion of leverage power on the pad. The spring has a horizontal joint, with

a movable catch, so that the lower arm carrying the pad may be altered in direction to suit either side. The pad works in a slot with a thumb-screw, so that the direction of its axis or the length of its lever may be altered at will, while the lever-arm is bent up for about an inch, and then squared, so as to very materially increase the power. The pad is oval an inch and a half by an inch, and made of hard leather—a point, I think, of some importance. The only protection required for the skin is a little French chalk. When the pad has been accurately applied over the artery close, either above or below, to Poupart's ligament, the lever is to be depressed until the pulsation is quite checked, and the strap fastened one hole tighter than is necessary to secure this, as the skin yields considerably. The advantages of the instrument are its lightness, its cheapness, its readiness of application, and the freedom from pain involved in its use. As I regard it as the perfection of ingenuity in surgical mechanism, I make no apology for thus briefly introducing it to English surgeons."

Inguinal aneurism cured by compression of the abdominal aorta.—In the 'Lancet' for Oct. 26, 1867, is the account of a case of aneurism of the femoral artery, situated about an inch below the fold of the groin. The patient, a man, æt. 36, was under Mr. Lawson's care in Middlesex Hospital. The treatment was commenced, on Aug. 21, by the application of Carte's compressor to the femoral artery in the groin, just above the aneurism, which was so applied as to shut off all but a wave of impulse from the sac. The pressure was very badly borne, from the pain it produced; still the man took great interest in the treatment, and bore it as well as he could. He soon learned to regulate it for himself, screwing it up firmly as long as he could bear it, and only relaxing it every hour or so for a short time, when he could endure it no longer. The tumour, however, altered very little during six weeks of this treatment, the tourniquet being apparently used during the day-time, as described, and left off at night.

"On Oct. 9 and 10 there was a very decided improvement in the condition of the tumour; its density had further increased, and the pulsations considerably lessened in force. Notwithstanding these changes, Mr. Lawson decided to adopt the treatment pursued by Dr. Murray, of Newcastle, and to compress the abdominal aorta so as to completely arrest the flow of any blood through the aneurismal sac.

"On Oct. 10, at three o'clock p.m. (the bowels having been completely emptied by an enema), the man was placed thoroughly under the influence of chloroform. A Lister's tourniquet was applied over the abdominal aorta, just above the umbilicus, and another tourniquet was placed firmly over the femoral artery, just below the aneurism. The tourniquets were kept on for twenty-three minutes. Only once at the end of the fourth minute did a wave of blood pass into the sac of the aneurism, when the tourniquet over the aorta was at once tightened; but for the remaining nineteen minutes absolute compression of the vessel was maintained, and no blood entered the tumour. The man now became somewhat collapsed, and began to retch. The tourniquets were then removed, and the administration of the chloroform stopped. The pul-

sations in the tumour were diminished, but they were perfectly regular. It was, however, impossible to say whether the diminution of the pulsations were not due to the collapsed state of the patient. The man was returned to his bed, and the Carte's compressor readjusted over the artery. When the effects of the chloroform had completely passed off he complained of coldness and numbness of the legs, with soreness in the belly. At seven o'clock in the evening, finding that all pulsation had ceased in the aneurism, the man himself removed the compressor. The house-surgeon was at once sent for, and he found that there was no longer any pulsation in the tumour. Since that time the man has continued to improve. With the exception of some feeling of soreness in the belly, which lasted for about thirty-six hours, the patient suffered no inconvenience from the treatment.

"Oct. 17.—The aneurismal sac is now felt as a hard oval mass; the artery which leads to it pulsates strongly, but all impulse ceases at the upper edge of the tumour."

Pitha, cure of a cirsoid aneurism by injection of perchloride of iron. Quoted in the 'Gaz. des Hôp.,' 1867, p. 51, from the 'Alg. Med. Central Zeitung.'—A young boy was affected with a cirsoid aneurism of considerable dimensions on the left side of the head. The occipital, posterior, auricular, and temporal arteries were greatly dilated, to the size of a quill. The temporal and occipital presented sacs as large as a nut; the auricular was enormous, of a violet colour, easily displaced, pulsating very strongly. Compression was tried by means of a circular spring with pads; but it produced œdema, and though the tumour was reduced in size, it was necessary to leave it off. Then it was determined to try the injection of perchloride of iron. A clot was formed, the tissue became hard, some points suppurated, and the tumour diminished. After ten injections there remained only a little dilatation of the capillaries. The occipital, which resisted the longest, still presented some pulsation.

Ligature of various arteries. The aorta.—In the 'American Journal of Med. Science,' Oct. 1868, p. 415, is the account of another case of ligature of the abdominal aorta, which, like all the previous operations on this vessel, proved fatal. The operator was Dr. McGuire, of Richmond, Va. The operation was undertaken with the view of tying the common iliac, but the aneurism extended too high. The sac was ruptured during the operation, but the hæmorrhage ceased when the vessel was secured. The patient lived about twelve hours.

The subclavian.—A case of ligature of both subclavian arteries for axillary aneurism, at an interval of three years, with perfect success, is related by Mr. Furner, of Brighton, in the 'Med.-Chir. Trans.,' li, p. 163.

Distal ligature in aortic aneurism.—With reference to the case under Mr. Heath's care, reported at p. 309 of our former Retrospect, where that surgeon tied the subclavian and carotid arteries for supposed in-

nominate aneurism, we may notice a case by Mr. Knowles, published in the 'Lancet,' i, 1868, p. 750. There was a pulsating tumour extending upwards for an inch above the right sterno-clavicular joint. It was thought to be an aneurism of the carotid, involving also the innominate. A small aneurism was also detected in the left subclavian artery. There was a double aortic murmur. As the larger aneurism was growing rapidly, the right carotid artery was tied. The tumour became firmer, but its pulsation continued, and he suffered much from cough. The operation was performed on Nov. 1. The ligature came away on Nov. 16, and he seemed going on well for more than a fortnight. On Dec. 4, however, he was attacked with apoplectic symptoms, became hemiplegic on the left side, and died next day. A complete post-mortem examination was not allowed, but it was ascertained that the aneurism was aortic.

In the nineteenth vol. of the 'Path. Soc. Trans.,' p. 93, Mr. Maunder relates a case in which he applied a ligature simultaneously to the subclavian and carotid arteries for an aneurism at the root of the neck. The patient died on the sixth day, and after death the aneurism was found to be aortic, and the aorta was much obstructed by the coagulum.

In the same 'Transactions,' xviii, p. 42, is an account, by Mr. Heath, with a drawing, of the well-known case in which Mr. Fearn, of Derby, tied the subclavian and carotid (not simultaneously) for an aneurism of the innominate artery. The dissection is now in the museum of the College of Surgeons, and confirms Mr. Fearn's original account.

Reference may also be made to the 'Path. Soc. Trans.,' xix, p. 182, for a case of aneurism of the abdominal aorta in which Sir W. Fergusson tied the femoral artery. The pulsation was diminished for a day, but otherwise little effect seems to have been produced on the disease.

Ligature of the arteries of the tongue. 'Gaz. Méd. de Paris,' 1867, p. 634.—At the Academie de Médecine, Oct. 8, 1867, M. Demarquay read a memoir on this subject founded on twelve cases collected from his own experience and that of others. It went to establish the following propositions:—1. That the ligature of the lingual arteries is not difficult. 2. That the indications for this operation are not uncommon. It appears, from M. Demarquay's work, that the lingual has been tied several times to arrest hæmorrhage and that the hæmorrhage has always been suspended. Relying on this fact, the author asks why should not the arteries of the tongue be tied as a precaution when a deep-seated tumour has to be removed from this organ, since everybody is aware that there is risk of hæmorrhage whatever proceeding be adopted; but the essential point of the memoir is the advantageous result which this surgeon has obtained from tying the two lingual arteries, in order to produce atrophy of cancerous tumours of the tongue, and to obtain a prolongation of life. He has practised this operation three times on patients in a bad condition, and the result has been satisfactory in every case. The sequelæ of the operation were simple, and, setting aside some pharyngeal symptoms, marked by a little temporary dysphagia caused by the proximity of the lingual artery to the pharynx, the wound has

always cicatrized rapidly. M. Demarquay does not propose the operation as curative.

The best operation for exposing the lingual artery is Blandin's. Béclard was, according to Demarquay, the first who conceived the idea of tying the lingual. But Harvey had already recognised all the advantages that surgeons may obtain in cases of tumour from tying the different arteries.

In France, M. Mirault, of Angers, has the credit of having first applied a ligature to the lingual artery. Since that it has been tied by MM. Flaubert, Roux, and Maisonneuve, in France; by Liston and Moore in England; and finally by M. Demarquay.

Ligature of the carotid for intra-orbital aneurism.—In the 'British Medical Journal, Oct. 5, 1867, Mr. Z. Laurence relates a case of intra-orbital aneurism following on repeated falls while in a state of intoxication. This occurred eight days before the patient was first seen. Protrusion of the eyeball had been noticed on the following morning. There was a convulsive fit, followed by stertorous breathing, on that day, but there has never been any loss of power. When first seen the case was taken for one of orbital cellulitis, but shortly afterwards the usual symptoms of aneurism were discovered, viz. pulsation of the eyeball, and a loud bruit synchronous with the pulse, extending from the eyeball over the temporal and parietal to the frontal and opposite parietal regions. There was great chemosis, immobility of the eyeball, and loss of sight. Pressure by means of "Skey's tourniquet" was applied for twelve days almost constantly; but much difficulty was experienced in maintaining continuous effectual compression without interfering with the patient's respiration. "Nevertheless, thanks to the exemplary tractability of the patient, the compression treatment was, on the whole, effectually tried." The only good effect, however, which Mr. Laurence ascribes to it, was in the enlargement of the collateral circulation. The compression was assisted by ice to the tumour and the internal administration of ten-drop doses of tincture of digitalis and of liquor opii sedativus every third hour for two days. The patient's health began, however, to fail, the tumour increased in size, and repeated bleedings from the nose occurred. It was decided to tie the artery, which was done fifteen days after the commencement of the treatment. The operation was perfectly successful in curing the aneurism, though sight was permanently lost. The voice became husky after the operation, and remained so as long as he was under observation (four and a half months).

Ligature of the common femoral artery.—In the British Medical Journal, Oct. 5, 1867, will be found a paper by Dr. Macnamara, of Dublin, on the subject of ligature of the common femoral artery, just below Poupart's ligament, as recommended by the late Prof. Porter. This operation is usually considered very fatal, from gangrene and secondary hæmorrhage. But Dr. Macnamara points out that it has been performed eight times in Dublin (viz. three times by the late

Prof. Porter, once by the late Mr. Smyly, once by Mr. Butcher, once by Mr. Porter, jun., once by Mr. Collis, and once by Dr. Macnamara himself), and that all these operations were successful except Mr. Butcher's and Mr. Collis's. In the latter case there was a high division of the femoral artery. The ligature was placed just *below* the profunda (*i. e.* not on the common femoral at all), and the patient died of secondary hæmorrhage. This was not, therefore, strictly speaking, an example of Prof. Porter's operation at all; and as Mr. Butcher's patient died eleven hours after the operation from the effects of the bleeding which had occurred before it, this case also does not count as a death from the operation. Dr. Macnamara, therefore, claims uniform success for the six genuine and complete cases of this operation which have occurred at Dublin. Five of the operations were performed for popliteal aneurism; Dr. Macnamara's own for hæmorrhage after amputation of the thigh.

In a discussion on Dr. Macnamara's paper Mr. Collis stated that if a deep transverse incision were made, as Prof. Porter recommended, a number of lymphatic vessels were apt to be divided, leading to unhealthy inflammation. He recommends to make the first incision only through the skin, and then gently draw asunder the subcutaneous tissues, including the lymphatics, so as to avoid wounding the latter vessels. In order to avoid the accident which happened in his case, he thinks the profunda should be searched for in the neighbourhood of the part to which the ligature is about to be applied.

The advantages claimed for this method of tying the femoral are partly its much greater facility, but chiefly the greater immunity of the femoral vein from risk of injury; for the vein lies so far away from the artery at this level that, with ordinary care, the surgeon can hardly injure it in any way, while in Scarpa's space it is often very closely attached to the artery.

Femoral aneurism.—Three cases of femoral aneurism, in which the old operation of cutting into the sac, turning out the clots, and tying both ends of the vessel, was performed with success, are related by Mr. Birkett, in the 'Med.-Chir. Trans.,' l, p. 431; by Mr. Cooper Forster, in the 'Trans. of the Clinical Soc.,' i, p. 36; and by Mr. Gay, in the 'Lancet,' i, 1868, p. 780. In the two former cases the operation was performed on account of bursting of the sac; in the latter the operation was at first exploratory, as the nature of the swelling was obscure. It had at first presented the ordinary characters of aneurism, but then began to increase without pulsation. In this case also Mr. Paget, who saw the case, thought the sac had given way; but Mr. Gay could not satisfy himself that such was the case. A tourniquet was applied to the abdominal aorta in the first two cases; in Mr. Gay's there was room to apply it in the groin.

In the 'Brit. Med. Journal,' March 16, 1867, will be found the account of a case of femoral aneurism, in which Mr. T. Smith tied the external iliac artery successfully at the early age of twelve.

Spontaneous cure of an aneurism of the right axillary artery in a case

where the left subclavian artery appeared to be wanting.—In the 'Deutsche Klinik' for Nov. 2, 1867, Dr. Bernhard Beck relates a case of aneurism of considerable interest. The aneurism was spontaneous, and apparently of the true sacciform variety, situated in the right axilla; all the usual symytoms were present. The pulsation was completely controlled by pressure on the subclavian. There was a slight murmur with the second sound of the heart. No pulsation whatever could be detected in the subclavian or any of its branches on the left side, until the right subclavian had been compressed for some time, when a feeble pulse was to be felt in the neighbourhood of the shoulder (apparently in one of the scapular arteries), in the lower third of the brachial, and in the radial artery. It was concluded that the subclavian artery was obliterated, possibly as a congenital malformation. Pressure was applied directly to the aneurism, and the subclavian artery was submitted on eight occasions to digital pressure, which, however, could not long be tolerated. The patient soon quitted the hospital, but remained at home on suitable diet, at perfect rest, and continuing the pressure. The pulsation gradually diminished, the symptoms of pressure on the nerves of the brachial plexus, which had been severe, disappeared, and he began to work at his trade as a smith. One day he suddenly lost all power in the arm; formication in the skin followed, the pulse in the tumour and in the wrist disappeared, the fingers turned of a yellow colour, and the arm began rapidly to waste. The cure, from this time, was complete in the aneurism, and the tumour soon disappeared. The arm recovered power, though it remained weaker than it had been, the pulsation of the branches of the opposite subclavian became more perceptible than it had been before, and the carotid of the left side became much dilated. The aortic bruit disappeared, and the man seemed to enjoy perfect health.

Ligature of external iliac for the cure of elephantiasis.—In the 'Brit. Med. Journ.,' Nov. 23, 1867, Dr. G. Buchanan, of Glasgow, has related the particulars of a case of true elephantiasis of the lower limb, of five years' duration, following on repeated attacks of erysipelas, in a girl of 17. The affection was very considerable. She had been treated at the skin dispensary for four months, but without benefit; and on coming under Dr. Buchanan's care, he made trial of the effect of rest and methodical compression, so that there might be no doubt as to the disease being incurable by any means short of an operation. Finally, as these means did not produce any benefit, the external iliac artery was tied. The immediate effects of the operation were most gratifying. The size of the limb became reduced to the natural proportions, except that the foot still remained enlarged. She could go about with ease, which had before been impossible, and the skin, which had presented a hard, horny, scaly surface, became soft, elastic natural in colour and, in fact, in all other respects. This apparent cure had lasted from the period of operation in January till the reading of Dr. Buchanan's paper before the British Medical Association in Aug. 1867; and the success so obtained led Dr. Buchanan to speak warmly of the advantages of the operation, and to recommend its adoption in spite of the unfavorable

criticisms of Mr. Syme and others. At the same time Dr. Buchanan professes his inability to explain the mode in which the ligature of the main artery effects a cure in these cases, and he points out the imperfection of our information as to the permanence of such cure. Dr. Buchanan's caution in this respect was justified, unfortunately, by the results of his own case, of which he gives the following account :

"P.S. Nov. 11, 1867. Since the above paper was read my patient has had two or three fresh attacks of erysipelas in the limb, which have caused it to assume an appearance somewhat similar to what it had when I first saw it; so that I fear the disease must be considered as having recurred, at least to a considerable extent."

In this case, therefore, the success obtained was only temporary, and a knowledge of this fact must necessarily induce us to look with some suspicion upon the other published cases in which we have no information as to the state of the patient long after the operation. Dr. Buchanan gives the following summary of these cases :

"The experience of the operation is as follows. Ligature of the main artery of the limb for elephantiasis has been performed twelve times.

"1. Dr. Carnochan, New York, femoral ; cure.
"2. Dr. Carnochan, New York, femoral; cure.
"3. Dr. Carnochan, New York, femoral; cure.
"4. Dr. Carnochan, New York, femoral ; cure.
"5. Dr. Carnochan, New York, femoral ; cure.
"6. Mr. Statham, London, anterior tibial ; cure.
"7. Mr. Butcher, Dublin, femoral ; cure.
"8. Dr. Fayrer, Calcutta, femoral ; (pyæmia, eighteenth day); death.
"9. Mr. Alcock, Stafford, femoral ; cure.
"10. Mr. Bryant, London, external iliac ; cure.
"11. Dr. P. H. Watson, Edinburgh, femoral ; improved.
"12. Dr. George Buchanan, Glasgow, external iliac ; improved.

"Thus, of 12 instances of ligature of the femoral or external iliac artery, gangrene occurred in none ; and only one proved fatal, from pyæmia, after the limb had shrunk as much as those which ultimately recovered, an amount of success comparing very favorably with most major operations."

On enucleation of nævus.—In the 'Med.-Chir. Trans.,' l, p. 57, Mr. Teale, of Leeds, advocates the removal of nævus by the knife, preserving the nævoid (or degenerated) skin which covers the tumour. He calls attention to the frequency of a complete capsule surrounding subcutaneous nævi ; and he states that when the nævoid skin has been dissected off the tumour and preserved, the cicatrization so produced will obliterate the cutaneous nævus. Mr. Teale refers to cases under the care of Mr. Nunn and Mr. F. Jordan, related in the 'Lancet' for 1866, i, p. 456, and ii, p. 618, to show the success of this practice. He relates three cases of his own, in all of which the nævus was seated in the parotid region. In all these cases the tumour was removed without fatal hæmorrhage ; but in the first, after the exposure of half an inch of the internal jugular vein and the styloid process, a portion which passed still deeper was ligatured, and in this case facial palsy resulted,

which had not disappeared two years afterwards. In the second case the child died of scarlet fever soon after the operation, the wound not having yet healed. In the third case the child died of laryngismus five days after the operation.

[The compiler may observe that he has followed this practice in two cases of nævus near the eyelid, reported in his work on the Surgical Treatment of Children's Diseases, 2nd ed., p. 52, and that in both cases the tumour was removed without formidable hæmorrhage, but in neither did the operation appear to check the spread of the cutaneous disease.]

Mr. Teale's paper concludes with the notes of a case in which the injection of perchloride of iron into a nævus produced instantaneous death, probably from coagulation of the blood in the large veins, extending into the heart.

The following extracts refer to affections of the intestinal canal:

Internal strangulation of the bowel successfully relieved during life.—In the 'Med.-Chir. Trans.,' l, p. 67, Mr. Bryant has related a case in which a man who had an old hernia suffered, after some exertion, from symptoms of strangulation of the bowel. The hernial sac, however, was completely empty, and the finger could be passed through the ring. As the patient was rapidly sinking from fæcal vomiting and the ordinary symptoms of strangulation, Mr. Bryant decided on performing an exploratory operation. He cut into the hernial sac, ascertained that it contained only a piece of adherent omentum, exposed some thickened and œdematous bowel which lay near the abdominal opening of the hernia, and by passing the finger along this felt a fibrous cord which crossed the intestine. This was quite within the belly, and almost out of reach, until the wound had been enlarged. Then a pair of scissors was passed up to the band, and it was snipped across. The patient recovered without a bad symptom.

Mr. Bryant adds another case in his practice in which a similar operation might have been performed with every prospect of success; but the state of the parts was not recognised during life, and the patient died from gangrene of the intestine.

On subcutaneous rupture of the constricting rings in the taxis of hernia.—In the 'Annali Universali di Medicina,' 1867, 200, 201, pp. 346 and 83, will be found an interesting series of cases of incarcerated and strangulated hernia, recorded by Prof. Larghi, of Vercelli, in order to show the advantages derived from the forcible rupture of the rings constricting the hernial tumour by the thumb or fingers introduced under them. By this means the author says he succeeded in reducing every hernia with which he had to deal between the years 1856 and 1864; but he does not give the number or any approximation to the number of the cases. The method is thus described in one of the cases in this series:—a large congenital inguinal hernia on the right side, strangulated for about nine hours, and which had resisted the ordinary taxis. The patient was laid flat in bed, without any pillows, with a bolster rolled beneath his knees. "I placed my right thumb on the

inner and upper side of the tumour, with the nail turned outwards, and, pressing it upwards, I came to a thick superficial ring, into which I pressed the point of the thumb. This ring formed nearly a complete circle. On pressing the point still upwards, the ring yielded and ruptured partly. I felt the crack of its rupture. The portion of the ring which remained untorn I drove with the thumb inwards and downwards, till it was bent into an arc, with its convexity on the inner and lower side. I then renewed my attempts at taxis, but without effect. I then got a bench placed along the right side of the bed, and got on to it, so as to have more purchase; then I dilated again the above-mentioned superficial band, which was a portion of the internal column of the external inguinal ring. The right thumb having penetrated well up it into the inguinal canal, I applied the left thumb on the outer side of the right, back to back, and made the two together run up the canal; then tried again to reduce the hernia, but again failed. Then I went round to the left side of the bed, had the patient placed transversely across it, placed myself between his thighs, and again pierced the superficial belt with my right thumb, pressing it still further upwards, then pierced another and deeper membranous belt, which I thrust upwards and so burst, and I felt the crack of its rupture; again tried to reduce the tumour, but it would not yield." He goes on to say that, having satisfied himself that all strangulation was now removed, he left the case for the night, and that the hernia went back spontaneously next morning. He also mentions that his thumb was so tired by the exertions employed, that on trying to write with it he found he could not. The patient was left in bed with the thighs flexed for a few days, "in order to favour the reunion and cicatrization, or at least the diminution of the distension of the parts which had been torn and ruptured." Besides this case another is given in which strangulation of a scrotal hernia had lasted sixty hours, with copious fæcal vomiting. Only partial reduction of the hernia was obtained in this way; the fæcal vomiting persisted next day and the day following, with great distension of the belly, yellowness of the skin, and hiccough. Nevertheless, as the pulse was full and regular instead of thready, as it had been before the partial reduction, it was not thought necessary to interfere further. On the second day reduction was entirely effected, and after ten hours more, during which the patient was "a prey to incessant hiccough," he was relieved by copious defecation and recovered. The next case is one in which an enormous hernia had had its peritoneal sac ruptured by the patient himself in violent efforts at taxis, and who was admitted in a dying condition with gangrene of the integuments over the sac. A cutting operation was at length performed, after vain attempts at reduction, but the patient died. The fourth case is one of inguinal hernia, in which the method by rupture of the rings failed, and a cutting operation became necessary. But so convinced does Prof. Larghi appear to be of the advantage of tearing the rings over cutting them, that even when he had got the stricture exposed he spent a very long time in endeavouring to rupture it with his forefinger before incising it. The patient recovered. In the fifth case (one of femoral hernia) an attempt was made to introduce the finger under

Gimbernat's ligament, so as to rupture it subcutaneously, but it could not be felt. Operation became necessary; and after the stricture was exposed, it was ruptured with the finger and the intestine reduced. The patient recovered. The sixth case was one of old femoral hernia of considerable size, strangulated for seventy-six hours. The symptoms were grave, and from these, and from the smell of the patient's breath, Prof. Larghi concluded that the intestine was gangrenous. The patient was a woman twenty-one years of age. The hernia was found to be easily reducible. After reduction Prof. Larghi, with great trouble and after considerable violence, succeeded in rupturing the femoral ring. He then made an incision through the skin and the superficial fat, which had been contused in these proceedings. The object apparently was to avoid further strangulation, and to allow of the formation of an artificial anus. The patient remained in a doubtful condition for some days, with a hernial tumour presenting in the wound, repeated vomiting, constant hiccough, and other severe symptoms; ultimately she was relieved by copious defecation and the passage of some lumbrici, and recovered completely, but with a large hernia. The last case was one of recent femoral hernia in a man of sixty-five, caused by an accident, and strangulated immediately on its appearance, a space of ninety-six hours. An intestino-omental hernia was diagnosed, and it was believed that gangrene was impending. There were, however, no symptoms of fæcal extravasation. Ordinary taxis having failed, the thumb was driven beneath the lower column of the crural arch, and this was ruptured. Now, the hernial tumour was reduced in size by one third on compression. The intestine was thought to be reduced, leaving the omentum. Next day, the tumour having resumed its former size, the part previously ruptured was still further lacerated. The day after, the tumour was easily reducible, but reappeared immediately on pressure being removed. Two days afterwards a fæcal abscess formed, and for some time all the motions passed by the artificial anus. The patient recovered, but with fæcal fistula. Prof. Larghi regrets in this case that he made any attempts at all to reduce the hernia, and he thinks that after having ruptured the ring with his fingers he ought to have incised the superficial parts as in the preceding case. In this way he believes the formation of fæcal abscess would have been rendered less probable, and its extent, if it did form, would have been limited.

Radical cure of inguinal hernia in an infant.—In the 'Med. Times and Gazette,' Aug. 8, 1867, Dr. Fayrer, of Calcutta, relates the case of a native boy, æt. 3½, in whom he operated for the radical cure of a large inguinal hernia. The operation is thus described:

"On April 30 I operated by introducing a wooden plug, thus invaginating the scrotum into the inguinal canal. This was secured by two silk ligatures, which were introduced separately, perforating the abdominal wall near the internal ring a little apart, but, emerging through the same aperture in the integument, were firmly knotted over a small piece of wood, thus securing the plug, to the apex of which they were attached, firmly in the inguinal canal, the end of the plug pressing against the internal ring. The operation was performed under the

influence of chloroform, as without it it was impossible to keep the child quiet. As the needle perforated the abdominal wall, a quantity of clear fluid escaped, showing that the peritoneum had probably been punctured, as there was no hydrocele. The child was feverish and restless on the following two days; on the third day slight erysipelas of the integument of the abdomen set in, and I removed the plug by cutting the ligatures."

It is not necessary to give the subsequent particulars. The child recovered, and during the three weeks that he was under observation the hernia did not protrude at all, though he was constantly crying, and the opening appeared to be perfectly closed. The time, of course, is far too short to allow of any opinion being formed as to the permanence of the cure; but the fact of recovery having been speedy and complete, though the peritoneum has probably been penetrated by the ligature, is interesting. At the same time the great tolerance of the natives of India for surgical operations is to be remembered.

In the 'New York Medical Record' will be found the report by Dr. Krackowizer of a case of vesico-intestinal fistula, presented to the New York Pathological Society, March 13, 1867, and bearing a considerable resemblance to one under the care of the present compiler, to be found in the 49th and 50th vols. of the 'Med.-Chir. Trans.'* The patient, a man, æt. 28, had occasionally passed worms from the urethra since he was eight years old, and sometimes the seeds of fruit. Still he was in perfect health, and had served in the army during the late war, till discharged on account of a wound. After this he got married, soon after which all the symptoms of stone began to show themselves, with much tenesmus, and passage of urine from the anus. The urine contained a moderate sediment of muco-purulent matter. With regard to the part of the intestine affected, Dr. Krackowizer concluded from the symptoms during life that the fistula communicated with the small intestine.

"I suspected that this connection must be between the smaller intestine and bladder, as there never had been the least show of any broken-down fæcal matter in the evacuations; they were, on the contrary, always liquid; and when they were allowed to stand, a bran-like sediment from epithelium and mucus, stained with bile, settled at the bottom of the vessel.

"Moreover, he never passed any flatus per urethram, an occurrence so characteristic where the fistula exists between the bladder and the large intestines.

"In order to make out a direct connection between the bladder and gut, I thought it well to inject some coloured substance into the organ, and watch the effect. There being no other available colouring substance at hand, I employed some wash-bluing, under the impression that it was composed of the cyanuro-cyanide of iron. I make a dilute solution of this, and while the anus was distended I injected 12 ounces into the bladder; but when I opened the stopcock of the catheter, so as to allow the liquid in that organ to escape, none came. The injection then must

* See the last Retrospect, p. 314.

have left the bladder immediately after being injected; it seemed strange that none came from the bowel. An examination was made as high up as it was possible to make it, while the anus was distended with Sims' speculum, but no opening into the gut was discovered; no liquid was seen to dribble out from the walls of the rectum, nor did the finger reach anything to determine the existence of a fistula; in fact, the mucous membrane of the rectum seemed so far perfectly normal.

"I charged the attendant to mark particularly when coloured stools should appear. The injection was made at 1, and at 3 the first passage came, and several others at intervals afterwards; all of these were separated one from the other as soon as voided, but no colour was found in any. This circumstance at first appeared strange, but when I afterwards learned that the bluing was composed of indigo simply, I explained the non-appearance of colour by the rapid bleaching which that substance underwent in contact with the ammonia, the presence of which in the stools was easily detected by the smell. To be sure that this explanation was correct, I filled a tumbler with a recent fluid evacuation from the bowels, and added a small quantity of the washing-blue. The bluish colour which it imparted to the liquid disappeared in a few minutes, leaving the colour as it was before the addition of the washing-blue.

"Two days subsequent to this I took the common writing-ink diluted, and injected six ounces of it into the bladder. The stopcock of the catheter being opened, as two days previously, no fluid escaped from its extremity, but about ten minutes after, however, the patient had a stool which showed some of the colour; in the course of two hours more another stool was coloured nearly as dark as the injection itself; in two hours more another stool contained the colour, but not so intense, and four hours after the injection the evacuation had its usual brown appearance. This fact corroborated the opinion which I had previously held, that the fistula was high up, probably between the small intestines and bladder. This being the case, it was impossible to devise any rational plan to treat the fistula, but the only indication to fulfil was to relieve the patient of the stones in the bladder."

The usual lateral operation was performed and nine stones extracted from the bladder; the patient was for a time much relieved, but sank and died five and a half days after the operation. On post-mortem examination the marks of old peritonitis were found in the shape of strong adhesions around the sigmoid flexure. The communication of the bladder was with the vermiform process. There was a large sinuous ulcer at the neck of the bladder, probably caused by the lodgment of some of the stones. The opening from the bladder into the gut was situated near the right ureter, and was smooth bordered. Near this hole was another smaller circular opening, which did not communicate with the vermiform process, but ended blind at the depth of a couple of lines. As far as stated, the mucous membrane of the intestine was healthy. The kidneys were in an advanced condition of Bright's disease, which accounts for the fatal result of lithotomy. On the general question of vesico-intestinal fistula, Dr. Krackowizer says—

"As objects of surgical interference, cases of intestino-vesical fistula must be divided into two distinct groups.

"The *first* group, comprising cases in which the fistula exists between the bladder and the rectum, and can be seen and reached, permit surgical treatment.

"Of the *second* class, where the fistula exists between the bladder and any section of the intestines down to that part of the rectum which already receives a peritoneal investment, I think it must be said that it is beyond the reach of art.

"First, the exact situation of the fistula must always remain rather a matter of surmise, although the statistics indicate the cæcum as that part of the intestines which, by its not uncommon lesions, is most frequently the organ implicated.

"But even granted that the exact site of the fistula could be diagnosticated, how could it be attacked except by opening the abdomen, detaching both viscera from each other, and closing each fistulous opening separately with sutures? That such a procedure has the mark of fatality broadly stamped on it it is unnecessary to dwell upon.

"I refrain, too, from criticising the fantastic plan of a French surgeon (Barbier), who proposes to make a temporary artificial anus at the cæcum, and to introduce through it a metallic tube, reaching somewhat above the valvula Bauhini, through which the fæces from the ilium would be led past the fistula, which, ceasing to be the conduit of stercoraceous matter, might then close. After which the artificial anus might be closed also. The objections are so manifest that I forbear to enter on their enumeration.

"Quite distinct in scope and technicism from Barbier's is the plan to make an artificial anus for the relief of vesico-intestinal fistula, pursued by Pennell* and T. Holmes.† Both these surgeons had to do with cases in which the intestinal entrance of the fistula could not be detected by rectal examination. But both cases showed symptoms which made it probable that the intestinal end of the fistula was below the region in which, by Callisen-Amussat's operation, an artificial anus is established. Both these gentlemen succeeded in leading the contents of the bowels out through an artificial anus in the left lumbar region, so that they could no more engage in the fistula and reach the bladder. In Pennell's case the patient did well, and lived for many years. I am not able to find out whether the fistula healed and the artificial anus closed. In Holmes's case the patient was entirely relieved—for better than one year, I believe—from all the symptoms consequent upon fæces getting into the bladder; when these very same troubles reappeared, and the patient succumbed. The autopsy revealed the fact, that some time after colotomy by adhesion and ulceration a new fistula had formed, between the cæcum and the bladder, the deleterious effects of which, of course, could not be warded off by the artificial anus in the left lumbar region.

* A case of stricture of the rectum, wherein an artificial anus was successfully established in the lumbar region. By J. Wilson Croker Pennell. 'Med.-Chir. Transactions,' 1850, xxxiii.

† A case of lumbar colotomy, successfully performed for the relief of vesico-intestinal fistula. By T. Holmes, Assistant-Surgeon St. George's Hospital, London. 'Med.-Chir Transactions,' 1866, xlix.

"Although vesico-intestinal fistula is one of the rarer lesions, yet there is a goodly number of cases on record. But cases in which by it the possibility arose for intestinal worms to get into the bladder and be expelled per urethram, are exceedingly scarce. C. Davaine, in his 'Traité des Entozoaires et des Maladies Vermineuses,' Paris, 1860, has collected only 14 cases.

"In 2 of these the worms reached the bladder by a vesico-rectal fistula.

"In 3 cases the history is quite incomplete.

"In 1 case it is mentioned that death was imminent.

"In 1 case no post-mortem examination was made.

"In 5 cases it is mentioned that the troubles diminished or ceased after the expulsion of worms. In 2 of these cases the relief seemed a lasting one. If we look at them by the light which our case furnishes, I think we may greatly doubt that the fistula had healed radically.

"In only 2 cases the post-mortem result is reported.

"The case of Dr. William Kingdon ('Med.-Chirurg. Review,' July, 1842) bears such a striking similarity to mine, that I think it interesting to re-state it here:

"A boy, æt. 7, at the commencement of the year 1836 suffered from the retention of urine for more than eight days, after which an *Ascaris lumbricoides* presented itself at the meatus urinarius, and was pulled out by the child himself. One year afterwards the same thing occurred, and the mother extracted a worm from the urethra. Worms presented themselves successively at the opening of the urethra six months later, then in October, 1838, and in January and April, 1839. The passing of several worms per anum, violent pains in the region of the bladder, purulent urine, which afterwards passed with the stools, high and constant fever, transient loss of sight, and extreme exhaustion, were the leading symptoms, until death occurred, Nov. 15, 1839.

"*Post-mortem examination.*—The vermiform process, instead of occupying its usual place, dipped down in the small pelvis, and about one inch from its extremity adhered closely to the upper and lateral portion of the bladder, a little above the junction of the ureter with the bladder. The bladder itself was small and contracted around a hard body that was recognised as a stone, one and a half inch long and two and three fourths inches in circumference. The walls of the bladder were very much thickened, and opposed themselves almost entirely to the passage of the urine in the direction of the urethra. The mucous membrane of the bladder was ulcerated on two spots, and in a direct line with the orifice of the ureter, and a little above it were two fistulous openings, separated by a very narrow spur, which communicated with the interior of the vermiform process. Both ureters were very much enlarged, and both kidneys, more voluminous than normal, were so completely filled with pus that hardly a trace of healthy tissue remained.

"Dr. Kingdon divided the stone with care, and found in its centre a large pin. The stone had not been recognised during life.

"*Description of the stones in Dr. Krackowizer's case.*—There were five smooth and four rough ones. Dr. L. Voss, who assisted at the operation,

tells me there was a very small fifth rough one, which was lost. The smooth ones had a chalk-white colour; the largest was one and a half inch long, one and one fourth of an inch wide, and one inch thick. It was oval, and only one side showed a little evenness, from attrition. The other four smooth stones, of which the smallest was only half an inch long and about three eighths of an inch in width and thickness—while the remaining three were of intermediate size between the smallest and largest—had all originally a round or oval shape; but each one had the sphericity broken by two planes meeting at a right angle, caused by the grinding of the stones one against the other. The four stones, by putting them together, the corresponding planes facing each other, gave evidence that their relative position must have been all but permanent. The larger stone must have lodged on top of this cyclopic masonwork.

"The four rough stones were quite small; but each one was studded on its surface with warty protuberances. Each two formed a set in this manner—that each stone offers a small polished surface that corresponds most exactly with a similar surface of its mate. The fit was as perfect as between an axle and its box. This circumstance makes it evident that each set of two stones had an independent, well-secured spot in which they were held so fast that only the most insignificant sliding motion between each two was permitted. The ulcer at the neck of the bladder with the larger excavation on its left, and the smaller one on its right side, was undoubtedly the bed for the two sets of stonelets.

"Dr. J. Pramann, who had the kindness to make the sections of the stones, gives the weight of them as follows:

"Smooth stones,	1 gr. 177	Rough stones,	6 gr. 29
„	2 „ 143	„	6 „ 10
„	3 „ 106	„	8 „ 6
„	4 „ 80	„	9 „ 5
„	5 „ 22		
	528		50

Together, gr. 578.

"The section of the stones so far disappointed my expectations that the nuclei did not show anything characteristic which would lead one to suspect that they had immigrated from the intestines. The largest stone contained three nuclei, so that at one time three separate stones must have existed, which by ulterior earthy deposits coalesced in one. The next largest one had its nucleus quite eccentric, and contained a large cavity. Compact and porous layers, in irregular alternations, characterised each stone. Of the rough stones, only the largest admitted of being cut in two. Its structure was exceedingly porous.

"The material of all the stones was the same—phosphate of lime and a liberal admixture of carbonate of lime."

In connection with the subject of intussusception, a singular case under the care of the present compiler is related in the 'Path. Soc. Trans.,' xix, 207, where a large tumour formed by an intussusception of the upper part of the rectum and colon, presented at the anus, and,

having become partially separated by ulceration, was removed by ligature. The patient appeared at one time likely to recover, but ultimately died of pyæmia. On post-mortem examination the ileo-cæcal valve and adjoining portion of intestine were found absent, either from previous intussusception which had come away (of which there was no history), or from malformation. There was also a fibrous tumour of the gut.

The following extracts refer to affections of the urino-genitary organs and of the female breast:

Spontaneous fracture of calculi.—In the 'British Medical Journal,' Jan. 4, 1868, Mr. Southam, of Manchester, relates three cases, two under his own care, and the other under that of Mr. Luke, where a calculus, apparently originally single, was found in more than one piece in the bladder. This Mr. Southam believes to be the result of spontaneous fissure of the calculi, produced, probably, by the generation of some gaseous agent, from chemical changes in their earthy constituents, or from the decomposition of the animal mucus of which their cementing material is formed. He supports this view by a preparation (which he figures), from the Musée Dupuytren, in which such a separation seems to have taken place, but the pieces have been soldered together and encrusted with a subsequent deposit. In a case related by Liston the separation of calculi into fragments was thought to be due to the mutual impact of several stones on each other during violent exertion; and in other cases the action of the bladder has been thought to have produced this effect in cases of multiple calculus. But in the three cases here related the stone was single. It is true that, in Mr. Luke's case, a previous attempt had been made to crush the stone; but it was unlikely that this had produced the fissure, since, in the first place, the stone was not felt to be crushed at the time; secondly, the attempt at lithotrity preceded lithotomy only a short time; while the edges of the fissure were rounded off, as though the operation was of considerable standing.

The two cases under Mr. Southam's own care were both in boys, æt. 15 and 7. Mr. Southam says—

"In each of the cases I have brought forward, there being clear evidence that there was but one calculus, we must look for other causes of the fractures. Not only were they single, but, at the time of the fracture, two of them were composed almost entirely of lithic acid and oxalate of lime—materials not likely to be affected by any degree of force which might be applied to them in the movements of the body or from the action of the muscles of the bladder. As the calculus in Mr. Luke's case was composed chiefly of triple phosphate, the lithotrite may possibly have contributed to its fracture, although there is no evidence to that effect; but in the other two, though each patient had been sounded before he came under my care, the stone had not been detected. Nor could any injury have led to their fracture from my examination, for their structure was too compact to be affected by the sound; and, moreover, their surfaces plainly show that they must have been broken some weeks at least before I discovered them."

Dr. Guéniot presented to the Soc. de Chir. a preparation from the

body of a man, æt. 83, who had died of phlebitis in the Hôpital Neckar, after long suffering from stone. He had never been the subject of any operation, but had passed spontaneously as many as fifty small pieces of calculus. The fragments were unequal in size, but about as large as peas on an average, composed mainly of segments, more or less irregular, of the laminæ of a calculus. The notable thickness of these laminæ proved that it was not a simple shelling off or exfoliation, but really a breaking up of the mass. The condition of the man's health did not allow of any surgical interference in the hospital, so that he never had undergone any operative procedure. After death the bladder was found to contain three entire stones and three fragments of stone. Two of these fragments appeared to be parts of one of the stones: the third appeared to be a portion of one of the other stones, judging from losses of substance which they presented. Judging by their external appearance, they seemed to be phosphatic calculi. There was a very large cyst communicating with the bladder, which, however, did not contain any stone ('Gaz. des Hôp.,' 1867, p. 343).

Results of operation on 100 *cases of stone in the adult.*—In the 'Lancet,' Oct. 26 and Nov. 9, 1867, Sir H. Thompson gives the result of the last 100 cases of stone which he has operated on in adults. The majority were old men; and in many cases the patients were very bad subjects, exhausted by long previous suffering, and coming from remote parts of the world. Sir H. Thompson gives the following summary of the series:

"Of the 100 cases, 84, or about four fifths of the total number, were operated on by lithotrity, and 16 by lithotomy. The mean age of the 84 lithotrity cases was $62\frac{1}{2}$ years; among them were no less than 21 cases of 70 years and upwards, 2 being upwards of 80 years of age. Among these 86 cases there were only 4 fatal cases. The lithotomy cases, 16 in number, had a mean age of $63\frac{1}{2}$ years. The youngest was 42 and the oldest 80 years. Six were above 70 years of age, including 1 each of 77, 78, and 80 years. Six cases were fatal. Of the entire 100 cases of operation upon unselected patients, having a mean age of $62\frac{2}{3}$ years, and submitted to either lithotrity or lithotomy, there were 90 recoveries and 10 deaths."

These results he uses to establish the four following propositions:

"*The first proposition is*—That lithotrity is the most successful operation for at least four fifths of all the cases of stone in the adult which come under the surgeon's notice at the present time—a statement which is more definitely expressed in the fact that the rate of mortality for such cases in this series is barely 5 per cent.

"*The second proposition is*—That these successful results from lithotrity can only be obtained by performing the operation in accordance with certain rules which can be laid down.

"*The third proposition is*—That cases of calculus in which one of the two operations, lithotrity or lithotomy, ought not to be employed are exceedingly rare.

"*The fourth proposition is*—That by exercising an ordinary degree of vigilance for adult patients suffering from symptoms of urinary dis-

order, every case of calculus may be discovered in an early stage; may be successfully treated by lithotrity; and, consequently, that the operation of cutting for stone in the adult may be rendered obsolete, or applicable only for some very exceptional example which has been developed as the result of extreme neglect or ignorance."

In support of the first proposition, he refers to the great mortality which attends the cutting operation at this advanced period of life, and urges the necessity of a practical study of lithotrity, in order to realise the advantages which it offers. With regard to the second proposition, that lithotrity is only thus successful when performed according to certain rules, Sir H. Thompson directs his readers' attention to the following points:—1. The necessity for obtaining an accurate idea of the size of the stone and its nature. He recommends, in order to judge of the size, a beaked catheter-sound, provided with an index (figured in the text), which is to be pushed beyond the stone, the index pushed down to the meatus urinarius, and then the length of the stem observed, which is pulled out of the urethra till the stone can no longer be felt; or else to catch the stone twice, and, if possible, in two different directions, in a flat-bladed lithotrite. Then, by sounding with the instrument still holding the stone, the surgeon can discover whether there is another in the bladder. The note from the stone struck and the condition of the patient will indicate with great accuracy whether the stone is an acid or an alkaline one, a compound of the urates or of the earthy phosphates. The oxalate of lime calculus is much more rare, unless its volume is small. The resistance it gives to the lithotrite will indicate its quality. Very large uric acid stones should be treated by lithotomy in preference. 2. The general condition of the patient, a quiet unexcitable temperament, and an absence of liability to feverish attacks, being favorable to the endurance of numerous sittings, if the stone is large. Renal disease does not, in his judgment, entirely contra-indicate lithotrity, as he has thus treated with success several patients who "had advanced kidney disease, and were passing much constitutional albumen." 3. The propriety of a few preliminary catheterizations, to test the absence of irritability. 4. A short first sitting, and making the patient pass water for the first twenty-four to thirty-six hours lying on his back, so that the fragments may get somewhat water-worn and blunted before passing. 5. The use of the screw lithotrite whenever possible, as taking less time and shortening the sitting. 6. Having as few instruments as possible. In most cases nothing but a flat-bladed lithotrite is required.

Sir H. Thompson only uses the fenestrated instrument in exceptional cases. He dissuades the use of Clover's syringe, unless it is absolutely required, and reprobates the extraction of the fragments at the time of operation; but when angular fragments are setting up cystitis, crushing them often gives relief; and then, the fragments being small, they may sometimes be advantageously removed with the flat-bladed lithotrite. Finally, he observes on the great importance of detecting and removing the last fragment. It is often difficult to determine when there is pain and frequency in micturition, whether this is due to slight

inflammation of the bladder and prostate, or to a fragment which escapes the sound. Sir H. Thompson says—

"One hint respecting a plan which I have found useful in this state of doubt is the following:—Supposing that, after one or two careful explorations with the sound and with the small short-beaked lithotrite, the blades of which are easily reversed, and which can thus be made to traverse easily the floor of the bladder, nothing is found, I prefer to give up all interference, and let the patient have a week or two's freedom from instruments; but during that time he should on two or three occasions take a rough drive in an omnibus or other jolting vehicle. I know nothing which will so certainly increase the irritation if it is due to a fragment, while the effect will probably be very slight if none is present."

In support of his third proposition, he appeals to the fact that in the time occupied by this series of 100 cases he has never declined one. He thinks it would have been more worldly-wise to have refused one case (a fatal one), in which he performed lithotrity, and five or six of those in which lithotomy was performed; but he considers it a dereliction of duty to refuse such patients the slight prospect of relief which the operation gives them.

In speaking of his fourth proposition, Sir H. Thompson uses these words:

"It may seem a bold assertion, that every case of stone in the adult may be treated by lithotrity. Depend upon it this will be the case, and that its realisation is simply a question of time. I suppose no one will deny that it is an easy thing to diagnose the presence of calculus in an early stage, while it is yet small, and easily amenable to the crushing process. Very rarely does a calculus reach the size of a bean without giving marked symptoms of its presence—enough to send the patient to his surgeon—enough for his surgeon to suspect its existence. At all events, with anything like ordinary intelligence on the part of the patient and on that of his attendant, no stone should reach the weight of 100 grains, or measure an inch in its longest diameter—in other words, arrive at the size of a filbert, without discovery.

"Now, by way of proof, I wish to call your attention to the striking fact that among the eighty-four cases of lithotrity *all such stones were successful cases.* Each one of the fatal cases were stones of much larger size, occurring in patients worn out not merely by age, but by the long existence of the calculus and its fearful consequences. I am entitled, therefore, to say that every calculus, being discoverable with proper vigilance while it is still small, it is removable by proper means, with an almost certain prospect of success. I regard the operation of lithotomy, then, attractive as it is to the practical surgeon by its brilliancy, and by the qualities which it demands for its successful performance, as destined ere long to be unknown, or nearly so, in the cases of the adult."

In the 'Deutsche Klinik,' 1867, pp. 22, 299, will be found two interesting cases of combined lithotomy and lithotrity, under the care of Dr. Simon. The former case was remarkable in consequence of the

stone having recurred half a year after the first operation, and having again required to be broken up before it could be extracted. The patient was a young man 29 years old. On the first occasion the stone was found by measurement, before operation, to be not less than one inch in diameter, and was so hard that lithotrity was negatived. After the bladder had been opened by the ordinary lateral opertion it was found impossible to get the stone out of the wound, and it was accordingly broken to pieces by Heurteloup's "percuteur" with a hammer. When put together, the stone was one and a half by one inch. The operation was long and tedious, still the patient recovered without a bad symptom. Notwithstanding the care that was taken to see that no fragment was left in the bladder, the patient was again admitted into hospital half a year afterwards, and again the stone was so large, and the bladder so irritable, that lithotomy was undertaken. Again it was found that the stone was too large to come through the wound, and the same proceeding was adopted as on the former occasion. Each operation lasted nearly three hours, there being great difficulty in finding and catching the pieces of stone in the collapsed folds of the bladder. The patient again recovered perfectly in five weeks, and was known to have remained well for three years afterwards. Dr. Simon thinks it probable that a fragment was accidentally left at the first operation.

In the second case the patient, a man, æt. 31, had suffered from symptoms of stone nearly all his life. A very large stone (more than two inches in diameter) was caught in the lithotrite, and by sounding with this stone it was discovered that there was more than one in the bladder. Encouraged by his success in the previous case, Dr. Simon resolved to use the combination of lithotomy and lithotrity instead of the high operation, which would otherwise have been needed. The sounding was followed by some fever; nevertheless the operation was performed next day, though the temperature was still 102°. The breaking up of the first stone required more than twenty applications of the crushing instrument, and was finished in about an hour and a half; after which the second stone came into reach, which was of about the same size, and required equally laborious crushing. The patient, however, did perfectly well, and was able to leave his bed in four weeks.

In the same journal, p. 23, will be found a case in which Dr. Simon performed the supra-pubic operation on a child six years old, who had two stones in the bladder, one of which measured nearly an inch in diameter. He was encouraged to this operation by the good results obtained by Dr. Günther, in Leipsic. The operation, however, proved fatal.

On immediate union after lithotomy.—In the 'Gaz. Méd. de Paris,' 1867, pp. 704, 719, 733, 761, 777, 801, will be found a series of observations by M. Bouisson, of Montpellier, to prove the possibility of union by the first intention after operation for the extraction of stone. M. Bouisson refers to two cases of this nature published by Tolet and Boudon. He has also published (in his 'Tribut à la Chirurgie') a case of complete recovery in eight days. The method of lithotomy which

M. Bouisson usually employs is the median. He now contributes notes of four cases in which "the natural approximation of the edges of the wound made in the perinæum opposed an obstacle to the exit of the urine, and was actually followed by very rapid adhesion of the opposed surfaces."

The first case was that of an adult with oxalate of lime calculus (the size not specified), and stricture of the urethra. Median lithotomy was performed with an incision of about an inch. Next day only a little urine escaped by the wound; for the following two days the urine passed almost entirely by the penis. On the fourth day no water passed by the wound, which was almost cicatrized, and without suppuration. On the sixth day a few drops of urine escaped from a minute opening at the top of the wound. On the eighth day cicatrization was complete. No pus had been formed.

The second case was that of an elderly man, æt. 64, with partial paralysis of the bladder. Six calculi were extracted by the median operation. One of them broke under the forceps, and it was necessary to introduce the finger repeatedly and to wash out the bladder. Next day no urine had been passed either by the wound or penis, and the patient suffered from pain in the hypogastrium. A catheter was passed through the wound, and more than a quart of urine evacuated. Then the retention recurred. Accordingly on the following day a catheter was passed by the urethra and tied in. The wound healed by first intention, and was completely closed on the sixth day. The paralysis of the bladder remained permanent.

The third case was that of a lad, æt. 16, who had had stone for about eight years. Median lithotomy was performed with a small incision. Next day the urine escaped through the wound, but on the following day it passed entirely by the penis, and on the sixth day the wound was as completely closed as that of harelip.

The fourth case was that of a child, æt. 6, who was operated on by the "medio-lateral operation." The calculus was small, and the operation rapid. There was considerable hæmorrhage, which was stopped by twisting the vessel, after a vain attempt to tie it. Bleeding recurred a few hours after the operation, and was stopped by pressure and ice. The urine ran away by the wound during the night. On the following day it passed by the wound, but only when the bladder acted. In the evening a portion passed by the penis. On the third day almost the whole, and on the fourth the whole, of the water passed naturally. The wound was completely healed on the eighth day.

These four cases prove, in M. Bouisson's opinion, that the whole of the wound of lithotomy may be cicatrized by first intention without any formation of pus, the deep parts as well as the superficial, so that no infiltration of urine takes place.

M. Bouisson then passes in review the various methods of lithotomy in respect of their proneness to immediate union. He considers the hypogastric operation the most unfavorable for immediate union, and the recto-vesical operation as the most exposed to the formation of perineal fistula. The operation of vaginal lithotomy permits of the immediate union of the wound by suture, otherwise it would also usually

entail a fistula. The various methods of perineal lithotomy are then examined, and the following conclusions are announced:

Immediate union is obtained chiefly after perineal lithotomy.

The median operation is that which is most favorable to the rapid cicatrization of the wound.

Among the precautions or measures which favour this result the most efficacious are those which defend the wound from all contusion or laceration, and those which turn away the urine from the abnormal passage.

The wound is thus defended by reducing the volume of the calculus to that of the wound by means of lithotrity practised through the wound.

The irritating contact of the urine is avoided by passing a catheter through the urethra into the bladder, and leaving it in.

A wound thus made by a cutting instrument direct, of small extent, involving as little tissue as possible, in a region removed from risks of hæmorrhage, not exposed to any local violence, and freed from the contact of urine, may comport itself like any simple wound, and may therefore heal by first intention.

In the 'Medical Times and Gazette,' June 15, 1867, Mr. McCraith, of Symrna, relates a case of "Cystotomy from severe and long-continued suffering from Irritable Bladder." The patient, æt. 52, had suffered for about four years from irritable bladder; and not obtaining relief from the treatment adopted at Smyrna, had gone to Paris. His medical attendant in Paris was Dr. C. Phillips; Ricord and Civiale were consulted. He was sounded more than forty times, whilst in Paris, for three months, either with the object of searching for stone, or of making injections into the bladder. He was not at all benefited by the treatment in Paris—not more than in Smyrna. Dr. Phillips was of opinion that a tumour existed in the bladder, which was rendered probable from blood being often contained in the urine, with other deposits. He consulted Mr. McCraith some time after coming from Paris. His symptoms were almost constant straining from spasm at the neck of the bladder. Rubbing the glans and entire penis violently between the palms of his hands gave him some relief. In the spasm the muscles of the thighs and abdomen were in violent action. He spent entire days on the night-stool, "howling" with pain. The glans penis and orifice of urethra were in a state of ulceration from rubbing against the rim of the vase on which he sate straining. The prostate was natural, and not sensitive to touch. The passage of a sound was extremely painful, and left great subsequent irritation. The urine was loaded with mucus, blood-corpuscles, and pus-globules; several large so-called organic globules. When first passed, the urine was of a natural degree of acidity, depositing phosphates quickly.

Under these circumstances Mr. McCraith recommended cystotomy, being led to it by remembering a case reported in 'Braithwaite's Abstract,' January, 1856, p. 291, in which Sir W. Fergusson performed this operation. Dr. Phillips also recommended the same course on the authority of some cases published by Bouchardat in 1803.

The operation was performed in the median line, the neck of the

bladder being freely divided, so that two fingers could be passed into that viscus. Nothing abnormal was felt in the bladder.

The relief was considerable, the last report of the case being as follows:

"His present state, just two months after the operation, is as follows:—He reports himself as infinitely relieved; he gets about the house; his appetite good; sleeps well; he has, however, four or five attacks of spasm every twenty-four hours, which do not continue more than a few minutes. He bears the passage of a full-sized bougie without any inconvenience, and even its presence in the bladder for some time. A small superficial fistula has formed at the anus, which is being treated, without cutting, by Dr. Chasseaud. The wound of the operation has been completely healed some time—in fine, though not completely cured as yet, he is much pleased at the good results already achieved by the operation. The capacity of the bladder is still very limited; he must pass urine every half hour at farthest, but he is slowly improving in this respect."

The urethra after Holt's operation.—At a recent meeting of the Edinburgh Medico-Chirurgical Society Dr. Alexander Miller showed the bladder and urethra of a man who had suffered from stricture for many years. The stricture was "ruptured" according to Mr. Holt's method. The case proceeded perfectly satisfactorily till about a fortnight after the operation, when the patient became ill and died of obstruction of the bowels, from a double twist on the ileum. The preparation showed the urethra without a trace of stricture or injury, eighteen days after the "rupture" of the stricture—a remarkable testimony to the efficacy and safety of Mr. Holt's operation.

In the 'British Medical Journal,' Feb. 1, 1868, Mr. B. W. Richardson, of Dublin, describes and figures a modification, which he proposes, of Holt's (or as he contends it should be called, Perrève's) stricture-dilator. This modification consists in suppressing the central conducting rod of that instrument, and substituting for the conical forcing rod one constructed on the "dovetail" principle, which travels in a deep groove worked in the lower blade of the dilator. The advantage claimed is that the instrument is less exposed to the risk of "buckling."

Phimosis.—A method of gradual dilatation in cases of phimosis, where the patient will not submit to operation, or where there are chancres underneath, and the surgeon is apprehensive of syphilitic ulceration, is described in the 'Union Médicale,' 1867, ii, p. 422, from an American surgeon, Dr. Elliott Cones, in the 'Med. and Surg. Reporter.' It consists in distending the parts gradually with the branches of an ordinary forceps introduced between the prepuce and glans, bathing the parts with warm water. In this way, by three hours of gradual dilatation, this surgeon has succeeded in exposing concealed chancres. A special form of forceps is also described as applicable in such cases.

Persistent priapism. By Mr. Birkett, 'Lancet,' Feb. 16, 1867.—Cases of persistent priapism are exceedingly rare. Many writers on

the special diseases of the male genital organs do not even allude to the complaint, and in the records of English surgery there are only two instances.

T. V—, a labourer in the country, æt. 44, was admitted into Lazarus ward on the 14th Jan. 1865. He stated that he had been suffering from continued priapism for ten days. The only statement he made was, that after copulation the penis remained permanently erect. During the first week he felt passionate venereal desires, which subsided, and have not recurred. The cavernous bodies seemed to be the chief seat of the lesion, for the glans penis and corpus spongiosum were not turgid. The man suffered great pain in the part, which was increased by the least attempt at pressure or depression of the organ. He appeared to be cachectic and much out of health, although he stated that he had not been at all so. There was not the slightest evidence of any disease in any other organ of his body, each of which was carefully examined, especially the brain.

A common embrocation was immediately applied, and two days after admission Mr. Birkett introduced a bistoury through the fibrous tissue of the penis into the cells of the corpora cavernosa in two places on each side. Dark, thick, blood-like fluid flowed, resembling that which escapes from a large blood swelling when punctured.

Jan. 18th.—The penis rather œdematous, especially the glans; pain in the part less; priapism scarcely altered.

20th.—On the right side the swelling was more than on the left, and there was a distinct sensation of fluctuation. An incision was made, but only the same kind of bloody fluid as before escaped, with a trace of pus. Warmth and moisture were applied by means of wet lint and gutta-percha.

23rd.—More punctures were made on both sides, as the man bitterly complained of pain, and the penis had not diminished in size. Warmth and moisture continued.

27th.—Bloody fluid and a little pus escaped from the punctures; less pain in, and diminished rigidity of, the penis. Complains of pain in the perinæum. During the whole of the time to which this report refers he passed urine without any difficulty, and with only slight pain.

Feb. 4th.—Not so much pain; the erection is less, the corpora cavernosa being no longer rigid and hard, although there remains an œdematous state of the glans. Pressure by means of strips of soap plaster employed. There has been very slight constitutional disturbance. During the early part of this month the man progressed favorably, and was able to leave his bed and walk about; but towards the end of it suppuration took place in the left corpus cavernosum. An incision was made into it, about an inch below the glans, and pus and some sloughs came away. The finger could be passed into the fibrous capsule, and towards the crus into the perineal region. Strapping continued.

March.—During the whole of this month pus escaped from the openings in the sides of the penis, which were carefully kept open, whilst the sides of the organ were compressed by strips of plaster. Water-dressing was applied over the apertures.

April.—Suppuration continued, rather profusely at times, during this month, and about the middle of it an incision was made in the left crus penis behind the scrotum, in order that the pus might escape more readily by gravitation. This was attended with beneficial results; and although the man was low and his reparative powers were much reduced, in spite of a generous diet and tonics, he seemed likely to be soon well.

May.—In the early part of this month the man was rather suddenly seized with great constitutional disturbance, which resembled the commencement of an attack of pyæmia. It seemed, however, to be produced by some local inflammatory action, for after a more profuse escape of pus from the perineal opening the man rallied. From this date (about the middle of May) he gradually improved in health, the discharge of pus diminished, and he left the hospital on June 9th, well. At the time of his exit the penis was of normal size.

The recovery of this patient would have taken place about the middle of February, or in about a month after the extravasation of blood occurred, had not suppuration arisen, to which cause his protracted convalescence must be referred. From the moment of his admission Mr. Birkett determined to treat the case on the principle adopted in all swellings resulting from extravasation of blood; that is, to leave the repair of the injury to the efforts of nature, and not to interfere with the process of absorption. The man, however, complained so bitterly of the pain caused by the distension of the organ, that the incision was made for the purpose of affording relief mechanically—a practice Mr. Birkett would not again adopt.

The first case was recorded by Mr. Callaway in 1824. ('London Medical Repository,' 1824, p. 286.) The man was forty-four years old, and, whilst intoxicated, had connection with his wife. The state of the penis was exactly similar to that above described; and the priapism had continued unchanged for sixteen days, when Mr. Callaway made an opening into the left crus penis below the scrotum, and a large quantity of dark, grumous blood with small coagula escaped. The corpora cavernosa were emptied, and a few days afterwards the man was able to follow his work.

The second case is published in the 'Lancet' of July, 1845, and is described by Mr. John W. Tripe, of Hackney, under whose treatment he continued for four days, and was then admitted into the London Hospital, under the care of Mr. Luke. The man was a sailor, æt. 26. The priapism continued after frequent connection, and was persistent for about four months. In course of time the blood appears to have been absorbed, and the functions of the organ to have become perfectly restored. This man left the hospital after being therein only ten days, and the further progress towards recovery was unassisted by surgical art.

To these another may be added which was recently in St. Mary's Hospital, under the care of Dr. Handfield Jones, and in which, after persistence of the symptoms for a month, relief was obtained by an incision made by Mr. Haynes Walton into the corpus cavernosum of one side.

Azam, spontaneous separation of an adenoma of the breast. 'Gaz. des Hop.,' 1867, p. 302.—A woman, æt. 55, admitted for an inflamed mammary tumour. The breast was of enormous size. Thinking it had suppurated, M. Azam made a free opening. Bloody serous fluid was evacuated, but no pus. The same kind of fluid continued to run from the wound till, on the fourth day, a greyish mass presented itself in the wound. This being drawn out, was found to be "a fragment of the gland admirably dissected, with its lobes, its lobules, and its excretory duct; it was macerated in and impregnated with the cystic fluid." Two days afterwards another portion of the gland, weighing 350 grammes, was similarly eliminated, and some more portions of gland-tissue were scraped with the nail off the inside of the cyst. The opening slowly closed after two attacks of erysipelas. All trace of the tumour disappeared, and the breast resumed its natural size. M. Azam concludes that the movements of the glandular tumour, which had become pedunculated in the very large cyst formed around it, had in the end detached the pedicle, and thus caused the detachment of the mass. He conjectures that such cysts are formed as bursæ mucosæ are, by the movements of the skin, &c., over the tumour, and suggests whether it would not be desirable to provoke their formation by artificial movements, "by methodically and repeatedly gliding the tissues over the tumour—in a word, by a kind of shampooing."

The following refer to venereal affections:

Gonorrheal rheumatism in the female.—In the 'Gazette des Hôp.,' 1867, p. 34, Dr. Hemey has related two cases of rheumatism in females suffering at the time from gonorrhœa, and which he regards as having a gonorrheal origin. This conclusion was supported in one of the cases by the simultaneous appearance of ophthalmia terminating in staphyloma iridis. In both cases the urethra was the seat of active inflammation, and this the author believes to be a constant condition in gonorrheal rheumatism. In both instances, also, the patients were of a rheumatic family. Dr. Hemey believes that gonorrheal rheumatism only attacks patients who are (either themselves or their family) rheumatic, gouty, or scrofulous. He dwells much on the flying nature of the rheumatic affections in some parts, while there is, on the other hand, always one joint in which the affection is more prominent and more obstinate.

Syphilization.—A record, by Mr. Lane and Mr. Gascoyen, of the cases of syphilis treated in the Lock Hospital by syphilization during the years 1865-6 will be found in the fiftieth volume of the 'Med.-Chir. Trans.,' p. 281. The cases are 27 in number, divided into those in which the disease was recent, and no mercury had been given, comprising 22 of the cases, and the remaining 5 in which mercury had been given. All these had suffered from one or more relapses, and amongst them was one very severe case of tertiary disease. Short notes of all the cases are given, diagrams of the inoculations made in three of the cases, and a table at the end showing the lengths of treatment and the number of inoculations. The great majority of the cases were females.

Two died—one of sloughing phagedæna; the other, as was believed, of cancer of the liver. The average stay in the hospital was 5 months 16 days; the average duration of treatment, from the first inoculation till immunity was obtained, or the inoculations were discontinued, was 4 months 9 days; and the average number of inoculations was 259 in each patient—145 positive and 114 negative. Both observers agree decidedly in the opinion that syphilization is not a treatment which can be recommended for adoption; but in their theoretical appreciation of the effects they differ, Mr. Lane believing that it does exert some beneficial and specific influence over the progress of the disease, while Mr. Gascoyen ascribes all the benefit observed to the natural tendency to recovery, and to the regular life, diet, &c., of the hospital.

On immunity of the skin after long-continued irritation. By Henry Lee, F.R.C.S., Surgeon to St. George's Hospital. 'Lancet,' Jan. 12, 1867, p. 240.*—Prof. F. C. Faye has lately published, in the twentieth volume of the 'Norwegian Magazine of Medical Science,' some observations on the supposed property of the human skin to become less and less susceptible to the action of external irritants, until at length these produce no visible effects. This condition, when attained, is called "immunity." Dr. Faye had observed, some time ago, that blisters applied at short intervals to a limited surface by degrees became ineffectual; or, in other words, that the skin became more and more callous to the action of cantharadine, and that at last a condition of local immunity was produced.

"The only series of experiments made with the express purpose of determining the question were instituted some years ago at Paris. The report on these experiments, which appeared in due course, declared that after a time the skin really lost its power of reaction, and became less and less susceptible to external irritation.

"Dr. Faye mentions that he had used for the purpose of counter-irritation an ointment composed of one scruple of corrosive sublimate to two drachms of lard. In the course of ten or twelve hours after this is applied a thin crust is formed, and after this is removed a suppurating surface is left. The degree of inflammation produced by this ointment varied much in different cases. Its repeated application had sometimes to be discontinued; but, upon its reapplication, it was observed, as a constant phenomenon, that the irritation and secretion of the skin became less and less, until at last a state was attained in which scarcely any effect was produced.

"In some individuals, from the commencement, the effects of the application of the ointment were less, and more circumscribed; and in them, after its repeated application, the immunity was sooner attained.

"This plan of treatment, for some diseases, Dr. Faye has followed for several years, and, making allowances for different degrees of susceptibility in different cases, with uniform results.

"In healthy persons the susceptibility and power of reaction vary

* See the Retrospect, 1865-6, p. 308.

much. In some an external irritant can scarcely be borne for a few minutes without producing a painful blush on the surface; while others can bear the same application without much pain or irritation for a considerable period. Dr. Faye has observed several instances of such peculiarity, which, of course, has a marked effect upon the time at which immunity would be produced.

"When by degrees a torpid state of skin is obtained, so that the ointment above mentioned produces very little effect, the irritation of the skin can be continued by one or other of the following plans:—Either the ointment may be allowed to remain longer applied, or its strength may be increased. But it is to be noted that in the latter case the ointment, instead of producing simple irritation of the skin, is likely to induce mortification of its texture. The consequence of this is that the sores which follow become deep, and leave regular scars. This is not the same after the application of the ointment of the ordinary strength, which leaves only superficial sores.

"The action of such irritating matter would appear in some respects to be peculiar in infants. From long experience Dr. Faye has found in the treatment of purulent ophthalmia in newly born children that the milder irritants produce less visible results, and are more circumscribed in their operation than in older children.

"Dr. Faye says that he cannot express a distinct opinion on the point as to whether the continued application of irritating matter to a limited surface would produce immunity of the skin generally, nor how long the local immunity would last. All his experience had reference to the treatment of cases, and that treatment was discontinued when the cases were convalescent. From the facts which had come under his observation he is able to affirm that, after the application of the ointment as described, the skin on a large surface of the body—as, for instance, the nape of the neck and the back—becomes callous to its action, or, at the most, shows signs of a superficial soreness, which very soon dries up. And he also mentions that, after such application, the same irritants applied to other parts of the skin do not act so powerfully as those previously used.

"From these facts, occurring under his own observation, Dr. Faye draws the conclusion that the repeated application of the ointment of corrosive sublimate, or of croton oil, or of other simple irritating agents to large surfaces of the skin, will lead to similar results as those obtained in Paris by the repeated application of blisters. This immunity, however, does not extend through the whole texture of the skin; for if the smallest quantity of the same irritating substance which no longer produces any irritation on the surface be injected into the texture of the skin, a small abscess will without fail follow. Dr. Faye mentions that Dr. Danielssen had found similar results to follow the repeated application of antimonial ointment on different parts of the bodies of patients affected with leprosy in the hospital at Bergen.

"Dr. Faye wishes to draw a marked distinction between substances which produce irritation of the skin only and those which act chemically upon the tissues. The effects of the first class gradually cease; those of the latter continue as long as the skin remains alive. But he par-

ticularly dwells upon the fact that immunity of the surface of the skin does not necessarily imply immunity of other parts or of the general system. A very interesting illustration of this fact occurred during the last year. There was a patient of Mr. James Lane's in the Lock Hospital upon whom Professor Boeck supposed he had produced immunity by repeated inoculation. Mr. James Lane was good enough to allow me to test for myself whether immunity had really been produced. I inoculated some matter below the cuticle, a little deeper than the inoculations which had previously been made, but not deep enough to produce bleeding. The result was that in due course a small, well-defined, circular chancre, with sharp edges and a suppurating surface, was produced.* The surface immunity, then, in this case, did not imply an immunity for other parts. It was the surface of the skin only, and not the general system, which had become proof against one particular form of irritation.

"To the list of observers above mentioned may be added the name of Dr. Rennie, whose experiments and observations Dr. Faye had not seen when he wrote his essay. These observations are referred to at some length in the 'Lancet,' on the 7th of April last, p. 362, and they entirely confirm Dr. Faye's experience, the only difference being that Dr. Rennie's cases occurred almost exclusively in adults, Dr. Faye's chiefly in children.

"If, then, the observations already made, supported as they are by different physicians in the most remote parts of the world, should be confirmed by future experience, we have in the phenomena of so-called syphilization only another manifestation of a common law. The surface of the skin becomes proof to a greater or less extent against the irritation of specific puriform matter, as it would against the repeated action of blisters, corrosive sublimate ointment, or croton oil. But in none of these cases does the immunity to a particular irritant imply that that immunity extends to other textures besides the immediate surface of the skin; nor that irritants of a different nature would not produce their ordinary effects upon the skin itself; nor, again, that the same action might not be again produced upon the skin so soon as the immunity should have passed off. As far as our present knowledge goes, it would, therefore, appear quite possible for a patient to become proof against the further inoculation of specific purulent matter on the surface of the skin, and yet to become infected with another kind of syphilitic matter in the ordinary way, either through the skin or through some other part."

In the 'Annali Universali di Medicina,' 1866, 196, p. 114, Dr. A. Ricordi communicates two cases of "mixed venereal ulcer." Dr. Ricordi professes himself to be what is called, in the language of "syphilography," a "duallist;" and he brings forward these cases to show that

* The secretion from the pustule which preceded this sore was inoculated by Mr. James Lane, in the usual very superficial way of performing the operation. Two imperfect pustules were produced, and from these no further inoculations with the mode adopted could be made. Had the subsequent inoculations, however, been made to the same depth as the original one, a lineal series might, in all probability, have resulted.

a sore of mixed character may be produced by commerce between a person of one sex who has one kind of sore and one of the other sex having a sore of the other sort. Thus he explains the cases in which a true syphilitic or infecting chancre has appeared to be auto-inoculable. These mixed ulcers he believes to be not very common. They may, he says, become simple, and return to either of their constituent elements. If on a venereal (non-infecting) ulcer the syphilitic (or infecting) virus is inoculated, it will only transmit the venereal ulcer during the period of incubation of the syphilitic virus; afterwards it may become single, and only transmit the infecting or syphilitic ulcer; but in its perfect condition it is liable to propagate the mixed ulcer, or, from unknown causes, may transmit either form. When connection takes place between two persons with the different forms of ulcer, both may become affected with the mixed sore, or only one of them. The mixed ulcer is more often caused by inoculation of matter from a venereal ulcer or a syphilitic sore than the reverse. It is reinoculable, and its inoculation gives rise to a venereal sore. The adenitis which attends a mixed ulcer may be either indolent or suppurative and ulcerating.

On syphilis in animals.—In the 'Gazette Médicale de Paris,' 1867, p. 95, will be found some conclusions on the transmission of syphilis to the lower animals, which M. Auzias Turenne has formed from a series of experiments. They are as follows:

(1) Certain animals, especially monkeys and cats, are susceptible of contracting various syphilitic symptoms, both primary and secondary.

(2) The mucous membranes of animals do not seem very favorable to the development of most of these symptoms.

(3) The true and the false chancre are nevertheless developed on such membranes.

(4) A large indolent tubercle was observed on the lower lip of a female cat, which was reproduced thrice in exactly the same place, and ulcerated each time. At the time of each of these reproductions the cat was pregnant, and afterwards produced young ones, which only lived a few days.

(5) The primary symptoms in cats and monkeys are true and false chancres.

(6) He has not determined whether animals are susceptible of syphilitic blenorrhagia.

(7) Roseola has been noticed in the monkey and the cat.

(8) The hair is an obstacle to the recognition of this symptom, which most likely exists more frequently than it is verified.

(9) Disseminated crusts of acne constitute a common and obstinate symptom in animals.

(10) In the monkey, cat, and rabbit, these offer the same characters as in man, with the difference that they are general over the whole body in animals, while in man they are confined to the parts covered with hair.

(11) Alopecia is a lesion or a symptom of syphilis almost indubitable in the monkey and cat.

(12) Mucous patches and onychia are an incontestable manifestation of animal syphilis.

(13) It is probable that animals are subject to rheumatic pains, for, under the influence of syphilis, they often become very sensitive to cold, and the motions of their limbs are often impeded.

(14) The painfulness of the skin, and especially of the hair-bulbs, becomes manifest in some cases of syphilis in animals.

(15) Circumscribed acne, spreading syphilides, gummata, and tubercles of the skin, have been often observed in the cat.

(16) Animals may experience osteocopic pains, and present chronic constitutional affection of the glands.

(17) The cat which formed the subject of this paper had a fibrous tumour, which was indubitably syphilitic.

(18) Periostitis, and even exostosis, have been observed in the cat.

(19) A syphilitic cat produced young marked with syphilis and then becamo sterile.

(20) Monkeys do not bear our climate long enough to allow similar observations with regard to their females and young.

It should be added that the reality of these facts was warmly contested by M. Ricord.

At p. 445 of the same volume will be found the account of some inoculations of syphilitic matter on heifers and rabbits with negative results.

In connection with this matter the reader may consult in the 200th vol. of the 'Annali Universali di Medicina' a report by Drs. Ricordi and Dell' Acqua on the subject of the supposed accidental transmission of congenital syphilis from a baby to a cow. From many experiments which they made, and which they relate in the above paper, they decide against the transmissibility of syphilis from man to the lower animals.

"On the Geographical Distribution of Syphilis," see a report by M. Bergeron to the Académie de Médecine on a work by M. Lagneau in the 'Gaz. Méd. de Paris,' 1869, p. 375.

The following extracts refer to military surgery:

Healing of gunshot wounds by first intention.—In the 'Deutsche Klinik,' 1867, p. 261, Dr. Simon, of Rostock, brings forwards his experience of wounds received shortly before at the battle of Sadowa, to show that gunshot wounds, when uncomplicated by fracture, lodged bullets, or foreign bodies, may often heal by first intention. The cases comprised in this notice were 20 in number. The time which had elapsed since the battle was seventeen days. Twelve of the wounds were on the thigh, two on the leg, two on the arm, one on the forearm, and three on the trunk. They were all of them simple penetrating flesh wounds, with no lodgment of balls or portions of clothes. The patients were sixteen in number. Two of these were completely healed, and in all the others there was merely a little granulation about the entrance of the wound, with just sufficient suppuration to moisten the lint which was kept on it. Dr. Simon believes that the rapid union would be much more frequently observed were there enough surgeons in time of war to attend to cases which are doing well of themselves.

Dr. Simon remarks on the great difference between such a process of union and that which would be found in a lacerated and contused wound of equal extent with which a gunshot wound is usually classed. Surgeons employed in the field had also assured this author that they had noted indubitable cases of primary union of gunshot wounds.

Amputation at the hip-joint for gunshot.—In the circular No. 7, issued by the Surgeon-General of the U. S. Army, Washington, 1867, will be found an account of all the previously recorded cases of amputation at the hip-joint for gunshot injury, in number 108, together with 53 cases which had been reported to the surgeon-general as having occurred in the American civil war, and 19 of which were from southern sources. The cases, of which the details are sufficiently known, are divided by the reporter into 4 classes:—(1) Primary, in which 44 cases are included; of these 19 are American cases, and 3 of them recovered. The operations in 2 of the successful cases were performed in the Southern army, and the surgeon-general is doubtful of their ultimate recovery, but this is testified by Dr. Eve, of Nashville, Tenn., in a pamphlet entitled 'Contributions to the History of the Hip-joint Operations performed during the Civil War,' Philadelphia, 1867. (2) Intermediate, or such as were performed before the inflammatory symptoms consequent on the injury had entirely subsided. In this class 34 cases are reported, 16 previously published, and 18 American cases, all of which died. (3) Secondary, or such as were performed when the inflammatory symptoms had disappeared, and the lesions had become merely local. In this class are contained 10 published cases, 5 of them successful, and 9 American cases, of which 2 recovered; and finally, the fourth class is formed of reamputations at the hip, of which 8 cases are given; of these all but one are American, and 4 recovered. The total shows 105 tabulated cases, 16 of which recovered; and the reporter adds a slighter reference to 56 other cases, of which he could not obtain sufficient details to tabulate them, and of which 2 recovered. The gross result would be 161 cases, of which 142 were known to have died, 1 was doubtful, and 18 recovered.

Dr. Eve's pamphlet also contains a table of 13 resections of the hip for gunshot fracture, 4 of which recovered, and 1 would, it was thought, have recovered but for the privation of nourishment to which the Southern wounded were then and there exposed. Both publications comprise the opinions of various surgeons who had had opportunities of operating during the war. With remarkable unanimity they condemn primary amputation unless in very exceptional cases, and most of them appear to incline to expectant treatment as a general rule.

In the 'Deutsche Klinik,' Jan. 4, 1868, Dr. R. Volckmann relates 7 cases of perforating gunshot wound of the abdomen in which recovery ensued under his own care during the Prusso-Austrian campaign of 1866. In two of these the small intestine was wounded, in the third the stomach, in the fourth the urinary bladder, and in the other three the liver. In all, the reality of the visceral lesion was testified by the escape of the secretion or the contents of the viscus, and in one of the cases of wound of the liver of portions of the hepatic substance.

The new bullets and the wounds produced by them. By Alexander Bruce, Esq. ('Medical Times and Gazette,' Oct. 26, 1867).—"It is stated by the older authors on gunshot injuries that the aperture of exit is, as a rule, larger than that of entry. This statement, although doubtless true of the old round ball, is only partially so of the conical rifle bullet. It was, indeed, frequently noticed during the late wars that but little difference existed between the apertures, that of entry being not unfrequently the larger of the two. Sometimes, also, when the bullet had remained lodged in the body, a very remarkable extent of laceration of the soft parts was found around its track, and it was always much distorted in form.

"The penetrating power of a leaden bullet depends on several circumstances, which relate to its momentum, the comparative softness of its metal, and to the resistance offered by the body against which it impinges. If a bullet driven at a high velocity strike after a short flight (say 100 yards) an object capable of presenting considerable resistance, such as a bank of clay or sand, it will be found to have penetrated but a short distance, and to have become greatly altered in form, producing a correspondingly large and ragged hole in the substance in which it is imbedded, the reason being that the momentum of the bullet expended itself upon its own substance before penetration could take place. If, however, the same object be struck by the bullet whilst travelling with a lower velocity, penetration to a very considerable depth may occur, and the ball may be extracted comparatively uninjured, the aperture of entry being small. These facts will explain many of the apparent anomalies presented by gunshot wounds.

"As a general rule, the conical bullets hitherto in use in the armies of Europe and America have, when fired at a moderate range, a very considerable penetrating power, and produce, for the most part, cleanly cut apertures of entry and exit, even when they have met with considerable resistance in their course.

"Some years ago the principle of the exploding shell was combined with that of the rifle bullet, and I am informed that these are now largely used in India, especially in elephant- and tiger-hunting. A small metal capsule is introduced into the centre of the bullet, and filled with a detonating powder composed of chlorate of potash and sulphide of antimony.

"The effects upon an animal are described as terrific. If the bullet lodge in one of the cavities of the body, it explodes, and fragments of metal tear their way through the viscera, whilst the disorganization is increased by the sudden evolution of large quantities of gas. When a limb is struck, the muscles are lacerated and torn up from their connections; the bones also are usually comminuted, whilst the skin, curiously enough, is rarely ruptured. Such is the terrible missile, which, it is said, Herr von Dreyse has recently introduced into the Prussian army, having adapted it to the needle-gun.

"By a very simple contrivance, however, a bullet can be made to produce almost equally destructive results without the necessity of adopting so cruel an invention, and it is on this principle that the Chassepot in common with the Boxer and other new bullets are con-

structed. This consists merely in boring into the bullet a cylindrical cavity extending from the apex for about two thirds of its length; when in use the orifice of the cavity is closed by a plug of beeswax or boxwood.

"When such a bullet strikes an object presenting considerable resistance, the shock is communicated to the column of air in the interior, and is immediately distributed in a direction outwards to the walls of the cavity, producing the most astonishing effects upon the form of the bullet. The wound produced by such a mass must necessarily be fearful, the parts around the aperture of exit being especially liable to laceration, and the effects produced on the animal must differ entirely from those caused by a simple conical bullet; it is to these points that M. Sarazin has recently directed public attention. The effects, moreover, upon the internal organs are almost as formidable as those produced by the exploding shell, although not complicated by the escape of large volumes of gas.

"It is probable, however, that, unless the bullet struck directly upon its apex—that is, upon the orifice of the cylindrical chamber—the effects would not be so marked as in the case represented above, and in this particular the Chassepot, Boxer, and similar bullets are inferior to the exploding shells.

"The prospect of success in the treatment of such injuries would not appear very promising; but as yet there has fortunately been no opportunity of testing this point."

The following extracts refer to miscellaneous subjects:

Tetanus.—In the 51st vol. of the 'Med.-Chir. Trans.,' p. 265, Dr. Dickinson describes and figures the condition of the spinal cord in a case of acute tetanus which proved fatal in eighteen hours after the first accession of symptoms. Dr. Dickinson's paper confirms the assertion of Mr. Lockhart Clarke (in the 48th volume of the same 'Transactions'), founded on the examinations of six cases, that there are distinct and extensive structural lesions to be found in the spinal cord in fatal cases of tetanus. In the present case there were three remarkable swellings in the spinal cord visible to the naked eye, about the size of peas. The vessels of the cord, when examined microscopically, after preparation by Mr. Lockhart Clarke's process, were found gorged with blood; blood-corpuscles had escaped from the vessels, and were diffused among the nervous structures; and a structureless, transparent material was also poured out around the blood-vessels. The visible swellings above spoken of were due to a more extensive exudation of the same substance breaking up the tissue of the cord.

Alcoholic narcotism.—In the 'Brit. Med. Journ.,' June 15 and 22, 1867, Dr. Wade, of Birmingham, speaks of the difficulty which is often experienced in establishing a diagnosis between alcoholic or other poisoning, disease of the brain, and injury of the head. He calls attention to a class of cases with which he became familiar while living at the General Hospital as house-physician, of which both the history and the phenomena presented a most singular uniformity.

"A young girl, between 15 and 20, would be brought into the hospital in a state of insensibilty, the surface of the trunk, and of the extremities, of normal temperature, as tested manually, expression of the countenance perfectly placid and natural, no lividity, no frowning, no twitching of the eyelids, no contraction of the mouth, nor any trace of convulsion. The respiration quite tranquil, entire absence of stertor, no peculiarity about the pulse or breath-rate. The pupils in one sense natural, in another not quite so; that is, the pupils larger than they would have been in ordinary sleep, but not more dilated than they would have been had the patient been awake. This is an important point, because poisonous doses of alcohol produce dilatation of the pupils, and this want of correspondence between the size of the pupil and the apparent naturalness of the sleep is, no doubt, owing to slight alcoholic dilatation. The only other peculiarity about the girl would be her complete insensibility; no amount of shaking, shouting, or pinching would in the slightest degree seem to arouse her; possibly, during the shaking, a slight smile would play about the mouth for a moment, caused, I presume, by a dream, but which, on one or two occasions, raised for the moment a suspicion in my mind that she was shamming. There has been as much uniformity in the history given by the friends of such patients, as there has been in the symptoms presented by the patients themselves.

"The girl has been either actually a domestic servant, or has been, if living at her own home, acting as a domestic. The statement has always been that on the previous evening (for the admission into hospital has almost always been before midday) there had been a great quarrel, sometimes amounting to, or terminating in, a fight between some of the other inmates of the house, the father and mother, master or mistress, or between one of these and a lodger, but that the patient herself had taken no active part in this, and had not received any blow, fall, or injury; that, either late at night, when the disturbance had ceased, or else the next morning, she had been found insensible, generally not undressed, just in the condition in which she had been brought to the hospital, and which I have already described.

"I was in the habit of calling this coma a form of hysteria, for want of a better name, and concluded that the agitation or fright caused by witnessing the fray had been the determining cause of this presumed hysterical attack.

"In one case I remember the coma lasted for nearly, if not quite, twenty-four hours after admission, that is to say, in all for about thirty-six hours; but, generally speaking, I found that the administration of a fœtid enema, with some castor-oil, emptied the lower bowel, and that soon afterwards the patient awoke.

"I never observed any hysterical symptom of any kind whatsoever, nor anything else of an unnatural character, after the patient had once been thoroughly awakened. The awakening was most commonly abrupt, not gradual."

Accident led Dr. Wade to a correct view of these cases, from the circumstance of a servant-girl in his own family being similarly affected after having surreptitiously swallowed about 8 or 10 ounces of port wine.

He regards the effects as being produced by the rapid ingestion of a considerable quantity of alcohol in a young person unused to drinking. He calls attention to the absence of alcoholic odour, both in the breath and perspiration, the incomplete coma, and the state of the pupils.

From these cases Dr. Wade proceeds to remark upon the narcotic effects of alcohol, as distinguished from its stimulating properties. This, however, falls rather within the physician's province. Dr. Wade's conclusions are stated as follows:

"1. We ought to use alcohol empirically in acute disease, because there is at present no adequate theory of its action.

"2. When alcohol is beneficial, its good effects are speedily manifested.

"3. It is to be given for the relief of certain conditions of the system, and not for certain diseases.

"4. The conditions for which it is requisite may disappear as speedily as they may appear, and then the alcohol should be discontinued.

"5. We ought, therefore, to watch and judge by results, and disregard theories.

"6. In employing alcohol in large doses, we should never forget that it possesses narcotic properties as well as stimulant ones.

"7. It is not proved that acute disease neutralises or even antagonises these properties.

"8. It is not proved that acute disease does not render the system even more subject to these effects.

"9. There are some grounds for believing that its narcotic properties are beneficial in certain conditions arising in acute disease.

"10. No remedy which is potent for good can be impotent for evil."

Iodine injection in enlarged glands.—In the 'Medical Times and Gazette,' July 29, 1867, Dr. Marston, of Devizes, relates the following case:

"Miss N—, a lady about 35 years of age, consulted me in January last in reference to an hypertrophied cervical gland, which, from its situation and peculiar condition, had become very disagreeable to her. In early life she had suffered from strumous enlargement of the glands under the jaw and in the neck, and still showed a pretty considerable scar, which had some years ago been caused by an incision which had been made into a suppurating lymphatic in the cervical region. The tumour in question had slowly increased in size without any great amount of pain, until at length the integuments covering it had ulcerated, the diseased growth escaping through the opening thus made, while the skin retracted around its base, leaving it for its whole extent, from below upwards, completely denuded. The mass, in form and size, closely resembling a large walnut, was rather hard, somewhat lobulated, and apparently infiltrated with plastic matter. The patient was put under the influence of cod-liver oil and iodide of iron, with external applications of iodine to the tumour, under which treatment the general health greatly improved, while, however, no effect was produced upon the local affection, which, from the disfigurement it produced, was a

source of no small annoyance. Anxious though she naturally was to be freed from it, she yet had so great an aversion to the use of the knife that she was very unwilling to have it excised. I therefore determined to try the effect of injections of iodine into the substance of the gland, and for this purpose used an ordinary hypodermic syringe filled with the compound tincture of iodine. The needle being carried into the centre of the tumour, the fluid was slowly injected until it exuded from all parts of the surface, a considerable jet being thrown out by the elasticity of the structure, when the needle was withdrawn. No pain whatever was caused by the operation, nor did any inflammatory action follow. Seen again a week afterwards, the tumour was found to have decreased to almost half its original size. The injection was repeated, and in the course of another fortnight it had diminished to the size of a small bean, while the new skin was fast filling up the opening. A third injection was made, followed, in the course of a few days, by the complete disappearance of the growth and the perfect healing of the wound, leaving an almost imperceptible scar. No symptom of iodism occurred during or after the treatment.

"I have not yet had occasion to try the same mode of treatment in cases in which the skin remains unbroken; but the result of this case warrants its employment in chronic hypertrophy of the glands which resists ordinary medical treatment and external applications, especially as in such cases there would be a greater objection to excision, and the treatment would be attended with less risk of permanent disfigurement. It may also be a question whether such injections might not be employed in the case of other kinds of tumours. The risk of exciting inflammation might be reduced by using at first a less strong preparation."

In a subsequent number of the same paper, Nov. 2, 1867, Mr. Coates, of Salisbury, states that he has previously tried the same treatment to a considerable extent, and with results of a most important nature. He sums up his experience of it in the following terms:

"I have succeeded in curing strumous and cold or chronic abscesses without leaving scars, psoas abscess, bronchoceles (cystic and solid), ganglia, enlarged bursæ (including housemaid's knee), thick nævi, strumous disease of the joints, an encysted tumour; and in one remarkable case of strumous abscesses, strumous disease of, and suppuration in, the middle joint of the forefinger, great thickening of the first metatarsal bone, and of the fifth metacarpal bone, every vestige of disease disappeared under this treatment, aided by iodide of potassium, cod-liver oil, and iron, administered internally. The injections were thrown into the midst of each locally affected part in June, 1866. The child is perfectly well, and, what is very interesting in this case is, that there is perfect motion of the once diseased and suppurating joint of the forefinger.

"In July, 1866, I injected into masses of enlarged glands of the neck undiluted compound tincture of iodine, in the Salisbury Infirmary, in two patients, with the effect of dissipating the enlargement in one case, and of diminishing it in the other. In neither of these cases was there ulceration. I also injected, in August, 1866, the same preparation into

an enlarged post-cervical gland of a gentleman who applied to me for strumous abscesses under both jaws. The gland was of the size of a walnut. It disappeared without suppuration.

"In February, 1867, I had the following case under my care in the Salisbury Infirmary:

"A dark, strumous-looking boy applied with a mass of diseased glands under the base of the lower jaw, on the left side, with an unhealthy ulcer of the size of a crown-piece. I directed a drachm of the compound tincture of iodine to be injected into the midst of the mass by means of Wood's syringe. This was done by the house-surgeon. The boy was brought to me two days afterwards, as the swelling and pain of the diseased part was great. A week's poulticing relieved the tension, the glands gradually diminished in size, the ulcer took on healthy action, and in eight weeks it had cicatrized, and now the boy is quite well."

General emphysema from rupture of the lung.—In the 'Medical Press and Circular,' April 29, 1868, is an account, by Dr. Mapother, delivered to the Surgical Society of Ireland, of a case of general emphysema from rupture of the lung, in a child 2 years of age, who had "had a fall, her chin coming against a stool. No local injury resulted, but the child, being greatly frightened, seemed to cease breathing for a moment or two, and then screamed violently. When the mother took her up she perceived a swelling above each collar-bone, which gradually spread to the surface of the chest, neck, and eyelids. When admitted into St. Vincent's Hospital, thirty-six hours after, these parts were tensely emphysematous; there was neither fractured rib nor clavicle, nor any other injury, the skin of the chin, where it was said the blow was received, not being ecchymosed. There was no difficulty of breathing or cough. I conceived that a forcible inspiration occurred after the fall, and that the air-cells near the root of the lungs, being thus distended, were burst by the sobbing and crying movements, which are expirations with the glottis closed. The air was then pumped into the posterior mediastinum, and thence towards the skin. In anticipation of pulmonary inflammation, I gave a little grey powder; and to lessen expiratory force, and prevent further inflation of the areolar tissue, I put a bandage round the chest. The air gradually passed away, and on the seventh day after the accident the child was in perfect health."

In some interesting remarks Dr. Mapother discusses the cause of this injury and other points connected with it as follows:

"The following points seem worth discussing:

"1st. The rupturing force has been the retarded expiration in cases of hooping-cough, foreign bodies in bronchi, a sudden cry or laugh, loud speaking (as occurred in the case of a barrister while pleading), primiparous labour, hysteria, and during the reduction of a dislocated humerus. In all such instances there is a full inspiration, and the expiratory movements are most forcible, but the exit of air is not free. Rupture of air-cells usually occurs in the difficult expirations of animals in whom the pneumogastric nerves are cut, the laryngeal muscles becoming so flaccid that the arytenoid cartilages fall together, and it is

probable that in hooping-cough (which is the most frequent cause of this kind of emphysema) these nerves are functionally disordered.

"2nd. The air-cells near the root alone rupture, because elsewhere the lung is firmly enveloped in pleura, and the elastic subpleural layer described by Stokes.

"3rd. Out of thirty-eight such recorded cases which I have analysed, thirty-four were in children under four years. At that period the average weight of both lungs is seven ounces, whereas it is six times as much in the adult. These organs rapidly expand from their fœtal state, so that the air-cells, which are about 1-250th of an inch at birth, are soon twice that size, their walls being softer and thinner than in the adult. The upper part of the chest in children undergoes the most vigorous movements, and, considering the need for abundant aëration, the respiratory force is several times more powerful in proportion to weight and height than in the adult. In the child the interlobular areolar tissue is extremely fine, and there is little fat in the posterior mediastinum, and the air easily makes its way to the subcutaneous layer; but there, from the abundant fat, it meets resistance, and the emphysema is rarely very extensive. For the above reasons it is very easy to burst the infant lung, and insufflation is said to be an occasional mode of infanticide in France. When removed from the chest the lungs bear a much greater expanding force without rupturing, as there is not unequal resistance. Children more frequently cry violently and are more subject to spasmodic cough than adults, and hence, again, their greater proneness to this form of emphysema.

"4th. General emphysema is to be explained only by rupture of some hollow viscus, for the inflation of the areolar tissues with gases evolved by decomposition has not been proved, on reliable evidence, to extend beyond the gangrenous part.

"Emphysema from ruptured lung has proved occasionally fatal, and in such cases the mediastinum has been found so greatly distended, and so much air effused under the pulmonary pleura, that apnœa should result.

"Lastly, as to treatment. Puncturing the skin and bandaging the chest are the surgical steps which seem advisable in cases in which respiration is impeded. William Hunter first advised puncturing the skin, having learned its efficacy in cases of cattle plague. The mediastinum and interlobular spaces must be relieved accordingly as the air fizzes through the punctures, and the free passage of air, which has been rendered less irritating by being respired, produces no ill effect upon the areolar tissue.

"A bandage round the chest is useful in lessening the expiratory force; but if there was much compression of the lung previously, it would be unendurable."

Similar cases were alluded to by several other members of the society.

Reunion of an amputated finger. By Walter Bernard, L.K.Q.C.P. —"On the 16th of November, Michael Nellis (shirt collar-cutter, æt. 19), while removing "a cut of collars" from a circular knife impelled by

steam, had half an inch cut off the top of the middle finger of the left hand, including the pulp and a portion of the nail. The line of separation ran in an oblique direction. I saw him in ten or twelve minutes after. He was depressed, pale, cold, and shivering. I inquired if the piece could be found. In a few minutes it was brought to me dirty, out of some rubbish. Having very gently removed all particles of dust and blood, I replaced the piece and adapted the cut surfaces, the portion of nail attached to the separated part being a guide to perfect coaptation. It has now (Nov. 27) united throughout, healing near the nail by granulations, the remainder by the first intention. I ascribe my success to the perfect coaptation of the surfaces, warmth, a good constitution, and securing the hand across the chest in order to prevent the finger from being jarred during sleep, and the parts disturbed. I adduce this as an additional case in proof of the prudence of making a trial to secure the reunion of separated parts."—'Med. Press and Circular,' Dec. 4, 1867.

Carbolic acid.—In the 'Lancet,' Nov. 9, 1867, Prof. Pirrie advocates the use of carbolic acid in burns. One of the cases is thus described:

"On many parts, especially about the face, neck, and shoulder, there were innumerable small vesicles (other parts were free from vesicles); and on the arm there were two bullæ, one about the size of a penny, the other a little larger. The burn was thus, evidently, partly of the first and partly of the second degree. The patient was affected with shivering; she complained of excessive pain; the pulse was extremely feeble, rapid, and irregular; and she was troubled with vomiting, which continued for two days. Two folds of surgeon's lint, dipped in a liniment of one part of carbolic acid to six parts of olive oil, were closely applied to the whole of the scalded surface, a double layer of tinfoil was placed above the lint, and the whole secured by means of a bandage. The air was thus completely excluded; and in ten minutes the patient, much to my surprise, stated that she was free from pain. On the second day after the accident the skin was greatly improved, and the bullæ seemed withering away. On the twelfth day the skin was everywhere perfectly healed, the cuticle having been thrown off; and, although the case was watched with the utmost care, not a single drop of pus was discovered.

"The sudden and perfect subsidence of pain, the withering of the bullæ, the complete healing of such an extent of scalded surface without the slightest suppuration, in a patient of feeble constitution and greatly depressed by shock, appear to me to show that carbolic acid is well deserving of trial in burns of the first and second degree. I have seen some scalds of less extent prove fatal, and I have seen many not so unpromising at first end in suppuration and ulceration of skin, and require months to heal."

In the 'Brit. Med. Journ.,' March 7, 1868, is an account by Mr. Machin, of Erdington, near Birmingham, of an accident which occurred in the Aston Union Workhouse, in which three women affected with the itch were sponged over with Calvert's Carbolic Acid, used for disinfecting purposes, by mistake for sulphur lotion. Giddiness and rapid

insensibility followed, and in two out of the three cases death ensued; in one case, as it seemed, from shock, without any return of consciousness; in the other death was attributed to congestion of the lungs, consciousness being perfect to the last. About six ounces were used for dressing the three cases. It was warmed and sponged over the whole body.

Apparatus for writer's palsy.—In the 'Gaz. Méd. de Paris,' 1867, p. 108, an apparatus is described which M. Desormeaux exhibited to the Société de Chirurgie, and which is intended for the relief of scrivener's palsy. It is described as being very light and very cheap. Its object is to suppress the action of the thumb in writing, and this is effected by adapting the pen in a suitable position to a metal plate fixed by rings to the index and middle fingers. The thumb then remains inactive, and is rested on the paper or on the last fingers during the act of writing. M. Desormeaux has satisfied himself that writers who could use no other machinery were able by means of this apparatus to write for hours without fatigue.

The pathology of paralysis with muscular degeneration (paralysie myosclerotique), or, paralysis with apparent hypertrophy. By Dr. Duchenne, of Boulogne. (An abstract of a communication made in the author's name to the Pathological Society of London by Mr. Lockhart Clarke.)

Summary of symptomology.—The clinical facts which serve as a basis for studying the symptomology of the disease show that paralysis with degeneration (*sclérosie*) of muscles, or with apparent hypertrophy of muscles, is marked, in general, by three distinct periods or stages—a stage of paralysis, a stage of hypertrophy, and a stage in which the paralysis becomes general.

(1) The first stage is manifested either at the time when the children should begin to walk, or some years after they have begun. In the former case, although the conformation of these children be quite normal, and although, while lying down or in the arms of their mothers or their nurses, they appear to possess their natural share of motility, yet, when they arrive at the age of twelve or fourteen months, if an attempt be made to stand them on their legs, they immediately fall down. It is not till they have attained the age of two or three years that they are able to stand upright or to walk, and even then they require support. In the latter case, after these children have walked well for several years, it is remarked that, either spontaneously or subsequently to some convulsions, they are soon fatigued by standing or walking; that, without some support, they find these operations become more and more difficult and painful, and that they are subject to frequent falls. Whatever may have been the age at which the malady first made its appearance, it is soon observed that, in order to maintain their equilibrium while standing or walking, all these children bend themselves very much backward and keep their legs very much apart; that at each step they incline laterally towards the leg which rests on the ground—a movement which produces a characteristic balancing of the body during progression.

(2) The second stage is announced, in general, some months, and even two years, after the beginning of the muscular weakness, by a progressive swelling or enlargement of the gastrocnemii, then of the glutei and the lumbar muscles of the spine. This apparent hypertrophy occurs sometimes in nearly all the muscles that have been affected by paralysis; but, in general, it does not, and it may even be limited to a very small number of the muscles. The extension, to a greater or less extent, of the apparent hypertrophy of the muscles may constitute different varieties of this kind of paralysis. The hypertrophied muscles are firm and elastic; they become very hard while they contract, and show all the relief or projection which properly belongs to their contracted state; they then appear to form a hernial protrusion through the integument, which is very thin. Moreover, their great size shows off the apparent smallness and delicacy of the joints at the knee, ankle, &c.

In one case that came under my observation, both the weakness and the muscular hypertrophy appear to have shown themselves simultaneously. According to the information given by the mother, the child was very large at its birth. But this information is insufficient; we ought to know whether the great size of the body and of the limbs was or was not due rather to the abundance of subcutaneous adipose tissue than to the volume of the muscular masses.

The increase in the size of the muscles does not appear to add to their weakness. This is so far from being the case, that the muscles of the calves, which are always the most hypertrophied, are those which are found to have relatively the greatest power.

The morbid phenomena above described may remain in the same state for years—sometimes until a tolerably advanced period of youth.

A new stage of the disease, and the last one, is manifested by a gradual increase in the severity, and a more general extension, of the paralysis. The young patients can no longer stand upright; they always remain in the recumbent posture without any power to change the position in which they may be placed; and the upper extremities, if they have not hitherto been affected, soon lose all their movements. With this aggravation of the paralysis, hypertrophied muscles may sometimes be seen to melt, as it were, away, and then all the limbs and the trunk become atrophied *en masse*. Although in this stage the patients are reduced to a state of great weakness, they may nevertheless live for a tolerably long time. They are cut off by some intercurrent disease.

The figures which accompany this paper represent the appearances of several children differently affected by this disease. Of these cases, by far the most remarkable was a boy whom I saw in the Hôpital St. Eugénie, under the care of Dr. Bergeron. Every visible muscle of the body, except the pectorals, was enormously developed. When he walked, the poor boy had a most ludicrous appearance.

Dr. Duchenne informs me that he has been studying this disease for the last eleven years, and that he is now preparing a small work on the subject. Several cases have been recorded on the Continent, and post-mortem examinations have been made. Eulenberg and Cohnheim exa-

mined the body of a child which died of this disease at the age of thirteen. They found the electro-muscular contractility everywhere intact. Nothing abnormal was discovered in the nervous and vascular systems. To the touch, the muscles of the lower limbs gave the sensation of a doughy and inelastic mass. They were marked with stripes or striæ of a yellow or yellowish-white appearance. On section, they shone with a kind of greasy light. At certain points they could not be distinguished by the naked eye from the subcutaneous adipose tissue. The muscles of the upper extremities presented a similar kind of structure; but they were much atrophied, as were also those of the trunk. Under the microscope, those especially of the lower extremities seemed to be filled with adipose tissue; but the muscular tissue itself was not altered. Griesinger and Billroth had already observed a similar state in the living subject. It is rare, however, to find any oily particles in them ('Verhandl. d. Berliner Med. Ges.,' 1, 101—205). Heller, who examined two brothers that died of this disease, seems to consider it as a kind of fatty degeneration, for he calls it lipomatous ('Deutsche Archiv Klin. Med.,' 1, 616—627). Seidel also records three cases belonging to the same family, under the term of "lipomatous atrophy of the muscles, or muscular atrophy."

REPORT

ON

OPHTHALMIC MEDICINE AND SURGERY.

BY

ROBERT BRUDENELL CARTER.

THE years 1867 and 1868 have been fruitful of ophthalmic literature both in England and abroad. Systematic works on diseases of the eye have been published by Messrs. Power,* Bader,† Soelberg Wells,‡ and Macnamara.§ The work of Professor Stellwag v. Carion has reached a third edition in Germany, and has been translated in America.‖ Mr. Lawson has published a volume on the injuries of parts within the orbit.¶ The 'Physiological Optics' of Helmholtz has been translated into French.** Mauthner†† and Wilson‡‡ have written upon the ophthalmoscope. A portion of the second edition of Wecker's treatise has appeared.§§ Mooren‖‖ has given to the world the record of his experience at Darmstadt during the decennium 1855–66. The report¶¶ of the International Ophthalmological Conference at Paris, in 1867, has

* 'Illustrations of some of the Principal Diseases of the Eye, with a Brief Account of their Symptoms, Pathology, and Treatment,' by Henry Power, F.R.C.S., M.B. Lond., 1867.

† 'The Natural and Morbid Changes of the Human Eye, and their Treatment.' With a Portfolio of Plates. By Charles Bader, 1867.

‡ 'A Treatise on the Diseases of the Eye,' by J. Soelberg Wells, 1868.

§ 'A Manual of the Diseases of the Eye,' by C. Macnamara,' 1868.

‖ 'Lehrbuch der praktischen Augenheilkunde,' von Prof. Dr. Karl Stellwag v. Carion, Dritte verbesserte Auflage, Wien, 1867. The same, translated by C. E. Hackley, M.D., and D. B. St. John Roosa, M.D., New York and London, 1868.

¶ 'Injuries of the Eye, Orbit, and Eyelids; their Immediate and Remote Effects,' by George Lawson, F.R.C.S., London, 1867.

** 'Optique Physiologique,' par H. Helmholtz; traduite par Emile Javal et N. Th. Klein,' Paris, 1867.

†† 'Lehrbuch der Ophthalmoscopie,' von Dr. L. Mauthner, Wien, 1868.

‡‡ 'Lectures on the Theory and Practice of the Ophthalmoscope,' by Henry Wilson, F.R.C.S., M.R.I.A., Dublin and London, 1868.

§§ 'Traité théorique et pratique des Maladies des Yeux,' par L. Wecker, deuxième édition, tome premier, tome seconde, premier fascicule, Paris, 1867-8.

‖‖ 'Ophthalmiatrische Beobachtungen,' von Dr. A. Mooren, Berlin, 1867, pp. 342.

¶¶ 'Compte Rendu de la Congrès periodique International d'Ophthalmologie,' 3e Session, Paris, 1868.

been edited by the secretaries, Drs. Giraud-Teulon and Wecker. A report on the eye hospital of the Vienna University* has been edited, under the supervision of Arlt, by Drs. Tetzer, L. Rydel, and Otto Becker. In England we have to regret the discontinuance of the 'Ophthalmic Review.' The 'Ophthalmic Hospital Reports' have been issued at irregular intervals. The foreign periodicals devoted to ophthalmology are still in full activity;† and a large number of contributions upon ophthalmic matters have appeared in general medical journals. A great variety of smaller books and pamphlets has been published, and many of these will be mentioned under the subjects of which they treat.

(*a*) *Anatomy and Physiology.*

The minute anatomy of the component parts of the eyeball has engaged the attention of many observers, whose writings will be enumerated at the end of this report, but whose results need not be here set forth. Among the contributions to ophthalmic physiology there are some that it is necessary to mention.

M. Milliot‡ has presented to the Académie des Sciences a paper detailing the results of his numerous experiments on animals with regard to the regeneration of the lens after extraction. His experiments were performed upon rams, dogs, cats, rabbits, guinea-pigs, rats, and frogs. He made a corneal incision, either superior, inferior, or external, divided the anterior capsule, and pressed out the lens. After the operation the eyelids were united by suture, and sometimes the ears of the animal were secured in the same manner to the skin over the margin of the orbit. The general result was that the crystalline lens was frequently reproduced, although not quite of its natural size. The reproduction always occurred within the cavity of the capsule, and the tubes of the lens presented the same phases of development as in the embryo. Reproduction was impeded by extensive injury to the capsule, and was stopped by general inflammation of the eyeball, but was rather promoted by iritis or cyclitis. The anterior capsule, with, perhaps, the most peripheral part of the posterior capsule, were alone concerned in the regeneration. The process commenced at about the end of the second week after extraction, and was completed in from five to twelve months, except in old animals, in which it was still more tardy. The presence of cortex left behind in the extraction appeared to have no favorable influence. When the posterior capsule was lacerated in the operation, so as to permit the protrusion of a bead of vitreous, only a ring of new lenticular tissue was formed around this bead (the *Cristall-wulst* of W. Sömmering). M. Milliot purposes to continue his researches, and to extend them to the human subject, and will publish his results in the 'Journal de l'Anatomie et de la Physiologie.'

Dr. Steffan§ concludes, both from anatomical research and from clinical

* 'Bericht über die Augenklinik der Wiener Universität,' 1863-65, Braumüller, 1867.

† 'Archiv für Ophthalmologie;' 'Klinische Monatsblätter für Augenheilkunde;' 'Annales d'Oculistique;' 'Giornale d'Oftalmologia Italiano;' 'Nederlandsch Verslagen.'

‡ 'Annales d'Oculistique,' 1867.

§ Ibid.

observation, that the external layers of the retina, which form the perceptive portion of the organ, derive their nourishment from the choriocapillaris, and that the vascular system of the central artery supplies only the internal layers, which form the organ for transmitting luminous impressions to the brain.

M. Sappey, in a paper presented to the Académie des Sciences of Paris,* has described several bundles of smooth muscles that he has observed in the human orbit. He says, "The electrization of the superior extremity of the great cervical sympathetic produces, besides dilatation of the pupil, congestion of the conjuctiva, and opening of the eyelids, a projection of the eyeball forwards. This movement presents the characters of those caused by the muscles of organic life. It is caused by smooth muscular fibres that form part of the orbital aponeurosis, which constitutes a veritable fibro-muscular sheath. The mechanism of the projection is as follows:—The smooth muscular fibres, scattered over the greater part of the sheath and collected into more distinct fasciculi at certain points, form the sheath into a contractile cone, with its base fixed and directed forwards, so that its walls, in contracting, push upon the posterior surface of the eyeball and cause it to advance."

The action of curare upon the visual organs has been studied by MM. Voisin and Lionville,† who describe a series of experiments upon the human subject. They observed a confusion of sight, a heaviness of the upper eyelids, with partial closure, a feeling of oppression at the frontal region, diplopia and pupillary dilatation, and sometimes divergent strabismus. These effects were produced in the order of their enumeration; and the doses which produced them, with greater or less rapidity and intensity, varied from 5 centigrammes to 135 milligrammes. They were given by the subcutaneous injection of a filtered solution.

Rogow‡ has instituted a series of nineteen elaborate experiments upon rabbits, sheep, and oxen, in order to determine the mode of action of Calabar bean and of nicotine in producing contraction of the pupil. He arrives at the conclusion that Calabar bean acts entirely upon the sphincter of the iris, through the terminal filaments of the third nerve. The action of nicotine is less simple and less easily determined; but it appears to be due partly to stimulation of filaments of the fifth in the iris, and partly to paralysis of the sympathetic. Its character is in some measure influenced by the manner of its application.

Dr. Dor, of Berne,§ has published the results of his investigations into the variations of ocular tension, tested by the ophthalmotonometer. The instrument employed is the same that he described in the 'Klinische Monatsblätter' for 1863, with some improvements, which are explained in the paper. He gives an account of many experiments on the eyes of animals, and of observations on about 200 human eyes. The degree of tension is expressed by weight in grammes. The normal tension is found to range from 25° to 29,° with 27° as a mean; and morbid

* 'Archives Générales de Médecine,' 1868.
† 'Journal de l'Anatomie et de la Physiologie,' 1867.
‡ 'Zeitschrift für rationellen Medecin,' 1867.
§ 'Archiv für Ophthalmologie,' xiv, 1.

tension ranged from 12° to 42°. Glaucomatous tension was considered to commence at 30°, and iridectomy usually produced a permanent reduction of 5°, whether or not the tension was previously in excess. The use of atropine usually produced a diminution of from 1° to 3°. Further observations upon this subject will appear in the forthcoming number of the 'Reports of the Netherlands Ophthalmic Hospital.'

Prof. Donders, in an elaborate paper on "Binocular Vision and the Perception of the Third Dimension,"* details the reasons, and describes the experiments, by which he was led, for many years, to believe that the perception of a third dimension was impossible while the eyes were stationary, and that it was entirely due to the movements of convergence by which they were directed in succession to different parts of the object. More recent experiments have led him to modify this view. He finds that many persons can recognise the third dimension, or the relative position of the parts, of an object seen only by the instantaneous light of a single electric spark; and hence he concludes that there must be an inherent power of perception of this matter, independent of ocular movement, and prior to experience. Some persons, however, require more than one spark before they obtain a correct notion; some require many. Hence he concludes that the original faculty differs in degree, and is capable of being improved by cultivation, and aided by the information gained by movement. He concludes with some speculations concerning the nature of, and the relations between, sensations and perceptions, which he commends to the consideration of physiologists. The space here available does not admit of any adequate expression of his views. Prof. Hering† writes to rebut some of the objections made against his experiments by Donders, and to correct an erroneous account of his conclusions.

The subject of accommodation has produced two important pamphlets. MM. Hensen and C. Voelckers,‡ professors respectively of physiology and of ophthalmology in the University of Kiel, have instituted an elaborate series of experiments upon the mechanism of accommodation, by exposing the ciliary ganglion and other nerves in living dogs, narcotised by the subcutaneous injection of morphia. They have also removed portions of the eye itself, in order to observe the movements of the ocular structures. They report a to-and-fro movement of the choroid and retina to the extent of half a millimètre; and their observations fully show the therapeutical value of an agent which, like atropine, arrests this movement. They have been able to see distinctly the increase in the posterior curvature of the lens during accommodation, and they give an exact account of other movements concerned in this function—an account which the space here available will not allow me to reproduce. Prof. Coccius§ describes the results of the careful examination of eyes that had undergone iridectomy, and in which

* 'Nederlandsch Archiv,' i, 1866; 'Archiv für Ophthalmologie,' xiii; 'Annales d'Oculistique,' 1867.

† 'Archiv für Ophthalmologie,' xiv, 1.

‡ 'Experimentaluntersuchung über den Mechanismus der Accommodation,' Kiel, 1868.

§ 'Der Mechanismus der Accommodation des menschlichen Auges,' Leipzig, 1868.

a portion of the margin of the lens and some of the ciliary processes were exposed to view. A good French *résumé* of his conclusions has been given by Dr. Schobbens.*

The changes in the nutrition of the eyeball that are produced by injury to its nerves have been carefully studied. The changes which take place in the eye after section of the trifacial are well known, but the explanation of them has been much discussed. Snellen, and afterwards Buttner, were able to prevent these changes in rabbits by giving to the eye a protective covering, formed either by the ear or by a shell, the eyelids being first united by suture. They therefore attributed the ordinary effects to the loss of sensation, which left the eye exposed to irritation from external agents. Schiff, however, maintained that such agents would be only occasional in their operation, and that disturbance of the nutrition of the eye must be the usual cause of the phenomena. An experiment, which at first seemed to have failed, has enabled Meissner† to demonstrate the correctness of Schiff's opinion. He attempted to divide, within the cranium of a rabbit, the trunk formed by the two superior branches of the nerve. The attempt seemed to fail, the sensibility of the conjunctiva and eyelids remaining undiminished. The animal was kept, and in time the ordinary effects of division of the trifacial appeared; the eye became inflamed, and the cornea ulcerated. Examination discovered that the internal portion of the nerve had been slightly injured by the knife, and it seemed natural to conclude that the disturbance of nutrition was due to the injury to this portion.

Meissner has found also a corroborative example. In one of Buttner's experiments the sensibility was destroyed, but the eye did not become inflamed. It was found that the internal portion of the nerve —the portion wounded by Meissner—had remained intact. Schiff‡ reports four experiments on cats and rabbits, which support Meissner's conclusions, and show that disturbance of the nutrition of the eye follows an incomplete section of the nerve, or even of the Gasserian ganglion. These experiments show that we cannot, notwithstanding Snellen's results, attribute neuro-paralytic ophthalmia to the action of external irritants, consequent upon the loss of sensation; and Schiff quotes cases in the human subject in which there was no loss of sensation, but in which impairment of the nutrition of the eye was due to partial changes in the fifth, exhibited by autopsy. As a contribution to the clinical history of the same question, Dr. Hippel§ reports three cases of impaired nutrition of the eyes in paralysis of the fifth. The first case occurred in a woman 36 years old, who had suffered from various nervous disorders for twenty years, and from frequent hæmorrhages as effects of emotion. The whole of the left side of her body was anæsthetic, and certain regions of the right side of the face. On the right side this partial anæsthesia commenced by acute pain in some branches of the nerve, followed by bleeding from the conjunctiva and ear, then by anæsthesia of the branches attacked. After some time sensibility was restored, these phenomena being repeated several times,

* 'Annales d'Oculistique,' 1868.
† 'Zeitschrift für rationellen Med.,' 1867.
‡ 'Gazette Hebdomadaire,' 1867.
§ 'Archiv für Ophthalmologie,' xiii, 1.

and the restoration being each time less complete. The eye occasionally suffered from corneal turbidity, with desquamation of the epithelium, diminution of the anterior chamber, irregularity of the pupil, injection, and softening of the globe. There were also small subconjunctival hæmorrhages, with excessive photophobia, spasm of the orbicularis, and entropion. If the blood were not absorbed, it produced desquamation of the conjunctival epithelium and the formation of cicatrices. The same phenomena occurred when the eye was closed by adhesive plaster and collodion. The second case occurred in a man, æt. 21; and in him, during anæsthesia succeeding cerebral disturbance attended by severe neuralgia, the left eye was without sensation, prominent, the pupil a little dilated, and the perception of light abolished. The right eye had its vision reduced to $\frac{1}{50}$ (that is, could not distinguish at a greater distance than one foot objects distinguishable at fifty feet by a normal eye), and its field of vision much diminished. The acuteness and the field of vision varied with the variations of the case, the former ranging from $\frac{1}{6}$ to $\frac{1}{100}$, the latter from ten to four inches of radius. The third patient was a woman of 48. On the 6th of May, 1865, she was attacked, after a fright, by acute pain in the whole of the left trifacial, while partial anæsthesia of the cheek constantly extended its area. There were very frequent paroxysms of neuralgia. In April, 1866, paralysis of the sixth nerve and of the portio mollis, followed by partial recovery. Since the middle of June purulent discharge from the left eye, occasional hæmorrhage, turbidity of the cornea, and loss of vision. On the 28th of July almost complete anæsthesia of the left side, taste and smell lost, hearing diminished. The left conjunctiva injected, with slight loss of substance in the inferior third of the cornea, from whence infiltration spread over a fourth of the cornea; the aqueous turbid, a slight hypopyon, the iris immovable, the power of winking partly lost, and the purulent secretion profuse. Notwithstanding the use of atropine and a compressive bandage, perforation of the cornea occurred, followed by an adherent leucoma. The author observes that this case in many respects resembles the results observed by Magendie after section of the trifacial. The loss of corneal substance occurred in the lower third, opposite the palpebral opening, and thus supported the opinion of von Graefe with regard to the hurtful action of desiccation by the atmosphere. Dr. Steffan* has operated for paralysis of the oculo-motor nerve, the result of a blow on the head, by bringing forward the internal rectus, and the operation was followed by complete sloughing of the cornea. He inquires how far this disastrous result may have been due to the effect of the nerve injury in producing impaired nutrition. The intimate functional relations between all parts of the fifth nerve and the eyeball are also illustrated by Dr. Hermann Schmidt,† who records cases intended to show that severe toothache diminishes, at least while it continues, the power of accommodation. The author attributes this influence, not to paresis of the muscle of accommodation, but to a reflex irritation of the vaso-motor nerves of the

* 'Klin. Monatsbl.,' 1867. † 'Archiv für Ophthalmologie,' xiv, 1.

eye. Dr. Alexander also mentions a case* in which amaurosis was produced by toothache, and disappeared when the tooth was removed.

(*b*) *Surgery.*

As regards the orbital cavity, as a whole, there is not much to be chronicled. M. Bourdillat† records at considerable length a case of hæmatocele of the orbit that was under the care of M. Demarquay. The patient was a young woman of 28, and the swelling, which appeared after a normal pregnancy, and without any assignable cause, had existed for eight years. The orbit was filled by a large, soft, elastic, fluctuating tumour, which projected the eye and produced diplopia, but had not otherwise affected vision. M. Demarquay gave exit by puncture to a considerable quantity of fluid, that partially coagulated, and that contained red and white blood-corpuscles. Believing that he had to deal with a cyst, he commenced a treatment by weak iodine injections. The third was followed by destructive inflammation of the eye, and then the whole contents of the orbit were removed by operation. The periosteum of the upper orbital wall came away with the mass, and was undistinguishable from it. The patient made a good recovery, and an examination of the tumour, the results of which are very fully given, showed that it consisted of an infiltration of the normal tissues by effused blood.

Prof. Knapp‡ describes an interesting plastic operation on the lower eyelid, after the removal of a cancroid growth, which occupied the internal two thirds and the inner angle of the lid, and extended two or three lines on the side of the nose. Under chloroform, the growth was removed by straight incisions, forming a rectangle, of which the superior and external angle was absent. The external commissure was then extended outwards by an incision curving slightly upwards. The inferior side of the rectangle was also extended outwards by an incision curving slightly downwards. The flap was raised, and, when bleeding had ceased, was united to a flap made by prolonging the horizontal lines of the rectangle upon the nose. The superior and internal angle of the external flap was united, by a point of suture, to the internal extremity of the upper lid. The wound was thus covered, and the external fourth of the lower eyelid was made to form the internal fourth of the new eyelid. The edges were evenly united by points of suture. The healing was normal, and the result extremely good. The same author describes § a variety of plastic operations on the conjunctiva. For pterygium or symblepharon, after removing the growth or separating the adhesion, he covers the surface with flaps of conjunctiva, in a manner similar to that of Mr. Teale. He unites the wound left after the removal of a staphyloma, not by sutures through the sclerotic, as in Mr. Critchett's operation, but by sutures through the conjunctiva only, in order to avoid the inflammation sometimes caused by the former procedure. He enters a threaded needle horizontally under the conjunctiva, near the middle line, about four and a half millimètres above the

* 'Klin. Monatsbl.,' 1868.
† 'Gaz. Hebdomadale,' 1868.
‡ 'Archiv für Ophthalmologie,' xiii, 1.
§ Ibid., xiv, 1.

upper border of the staphyloma, and brings it out, nearly on the same level, on the vertical line passing by the nasal border. The same needle is entered near its point of exit, and brought out on the middle line, four and a half millimètres below the staphyloma. The same manœuvre is repeated on the outer side. The staphyloma is then excised, and the threads are tightened and tied, so that the folds of conjunctiva close the wound like the mouth of a purse. The results have been satisfactory. The author lastly describes two cancroid episcleral growths, after removal of which he covered the exposed surfaces by conjunctival flaps. No recurrence has taken place. He insists on the necessity of bandaging both eyes, after plastic operations, until union has taken place.

M. Herrgott* relates an interesting case of the successful treatment of a large nævus, on the side of the nose and on the lower eyelid of an infant seven months old, by introducing fine sticks of *pâte de Canquoin* into its substance. Most of the ordinary modes of treatment had previously been tried without success. The caustic was made into sticks that precisely fitted a small canula, which, with its trocar, was thrust into the tumour. The trocar being withdrawn, the caustic stick was pushed into the canula, and this withdrawn, leaving the caustic behind. The stick was then cut off at the level of the skin. Three such punctures were made in a direction from below upwards and from without inwards, along the base of the growth, on the 15th of November. There was but little bleeding, not much pain, and very slight reaction. On the 9th of December two more punctures were made, at right angles to the former ones, and filled in the same manner. The nævus shrivelled up, and became transformed into fibrous tissue, and the child was discharged cured on the 27th of December. The contraction of the growth had not influenced the position of the eyelids, and the result was all that could be wished.

The histories of many tumours are recorded. A robust and healthy country woman, 45 years old, presented herself to Prof. G. Borelli,† of Modena, with the following statement:—She had received a blow on her head, and was confined to bed for some twelve days with headache and feverishness. When better, she found that the sight of her left eye was impaired, and she suffered from orbital pains and diplopia, with inflammation and hypertrophy of the conjunctiva at the external angle. She was treated for some months by scarification and other means, but the swelling constantly increased. Borelli satisfied himself of the existence of an orbital tumour; and having first freely divided the tissues at the outer angle, he carefully dissected down until the growth was exposed. He found it to be intimately united with the sclerotic, and to extend from near the corneal margin to the posterior part of the globe. The union with the sclerotic was so close as to lead to the belief that the tumour might be structurally connected with that membrane; but by adduction of the eye and careful exploration the margin of the growth was found, and the whole was removed. The growth was oblong, flattened, fully three centimètres long by one broad, and

* 'Gaz. Médicale de Strasbourg,' 1868.

† 'Giornale d'Oftalmologia Italiano,' 1867.

was of a fibroid character. The patient made a good recovery, interrupted for a time by neuralgic pains radiating from the wound; and the restoration of the functions of the eye was eventually complete, except that the power of abduction was limited.

MM. Sichel, père et fils,* describe a case of melanotic tumour involving the outer side of a blind and shrunken eyeball, in which they combined the modern operation of enucleating the eyeball with the old operation of dissecting out the contents of the orbit. The external rectus, being adherent to the orbital wall, could not be divided in the ordinary way. The internal, inferior, and superior recti were, however, cut through, and the eyeball released from its attachments in these directions. Then the external commissure was divided towards the temple, and the diseased tissues carefully dissected from the outer wall of the orbit. Lastly, the optic nerve was severed as far back as possible. The soft parts that were left afforded support for an artificial eye, and some bridles of adhesion at the outer canthus yielded to division and cauterization. Four years have elapsed, and the disease has not returned. The same authors call attention† to the occasional occurrence in the eyelids of cysts containing osseous or calcareous matter, and Dr. Rizet‡ relates a case of the kind. Such cysts are easily removed by a simple incision through the integument covering them.

Dr. Hippel§ describes a gummose tumour involving all the coats of the eye. The patient, a man, 45 years old, contracted a primary sore in April, 1865, and was treated by perchloride of mercury. Secondary symptoms followed, but had disappeared (save osteocopic pains) by the end of July. In September the right eye became injected and painful. In October vision was impaired, and the vision of the left eye suffered in the following month. In March, 1866, after exposure to cold, the right eye became completely blind and painful, and the left eye much enfeebled. Examination showed specific iritis, ptosis, the ocular conjunctiva bluish-red, two projections at the lower part of the sclerotic, the pupil entirely filled by a yellow mass, loss of vision complete, pain excessive. Enucleation was performed, and an intra-ocular tumour was discovered that involved all the coats of the eyeball. A microscopic examination, by Prof. Neumann, determined it to be a gummose syphilitic growth. Analogous cases have been recorded, in former years, by von Graefe, Colberg, and Arlt. Cases of tumours of the eyelids are described by Schirmer,‖ of tumours of the orbit and eyeball by Hirschberg,¶ and of malignant intraocular tumours by Lebrun.** Zehender†† has published a general review of the results of ligature of the carotid for pulsating tumours of the orbit; Joseph Bell‡‡ has published a successful case, and J. Z. Laurence§§ another, in which the carotid was tied for a traumatic aneurism.

M. Boissonneau, père,‖‖ suggests that a distended (staphylomatous) eyeball will become reduced if the liquid contained in it be suffered to

* 'Annales d'Oculistique,' 1867. † Ibid. ‡ Ibid.
§ 'Archiv für Ophthalmologie,' xiii, 1. ‖ 'Klin. Monatsbl.,' 1867.
¶ Ibid., 1868. ** 'Annales d'Oculistique,' 1868. †† 'Klin. Monatsbl.,' 1868.
‡‡ 'Ed. Med. Journ.,' 1867. §§ 'Ophth. Rev.,' 1867.
‖‖ 'Evénement Médical,' 1867.

escape through an open puncture. For this purpose he proposed to introduce into the puncture a little stud, perforated through its axis, and otherwise resembling that which was proposed by Nussbaum as an artificial cornea.

The literature of affections of the conjunctiva has been but scanty. Dr. Rudolph Schirmer* calls attention to the frequent occurrence of conjunctival irritation or inflammation in patients suffering from disturbance of the refraction or accommodation, and points out that permanent relief can only be afforded by proper spectacles. Dr. Durr† describes an epidemic of granular ophthalmia, occurring in the Institution for the Blind at Hanover, in which it was found that nearly all the patients suffered also from an analogous affection of the throat. The combination was found in 132 cases out of 135, from which Dr. Durr concludes that the two local disorders were due to a common cause. He insists upon the importance of abundance of pure air and of nourishing food, as conditions precedent to the successful use of local remedies. MM. Hennequin‡ and Lagarde§ describe each a case in which the application of calomel to the conjunctiva, in patients who were taking iodide of potassium internally, was followed by the most intense ophthalmia, clearly due to the conversion of the calomel into an iodide of mercury, and to the effects of the latter as a powerful local irritant. In one of the cases actual sloughing of a portion of the conjunctiva was produced, with consequent symblepharon, and it also fortunately happened that corneal opacities of very long standing became absorbed as the inflammation subsided. In the second case the patient was in the habit of using calomel for phlyctenular ophthalmia, and it was only when taking the iodide that her accustomed remedy produced any unusual effect. Dr. Sichel‖ writes strongly against what he terms the abuse of collyria containing atropine, in cases of keratitis, in which he thinks atropine is not needed, and in cases of iritis, in which its use is permitted to supersede the necessary and rational antiphlogistic treatment with which it should be combined. He places great stress, also, upon the method of applying collyria, saying that a drop should be inserted between the lids by means of a soft camel's hair pencil, and at the outer angle. The drop will then follow the course of the tears, and will be diffused over the eyeball before reaching the puncta. The strong collyria with atropine, now so much employed, and often thrown carelessly into the inner angle, are accused by the author of causing grave symptoms of poisoning, by their escape down the lachrymal passages into the nose and pharynx. That they should at least be used with due caution is shown by Dr. Nieberg,¶ who relates the case of a girl of sixteen, with cataracts, to whom he gave a phial containing half a grain of sulphate of atropine dissolved in a little water, with directions to apply a drop or two while he saw other patients. By some error, the whole quantity was applied to the eyes in the course of ten minutes, and acute symptoms of poisoning were speedily mani-

* 'Klin. Monatsbl.,' 1867.
† 'Uber die Verbindung von Ophthalmia und Angina Granulosa.'
‡ 'Gaz. Hebdom.,' 1867.
§ 'Gaz. des Hôpitaux,' 1867.
‖ 'Annales d'Oculistique,' 1868.
¶ 'Bull. de Thérapeutique,' 1867.

fested. Morphia was injected subcutaneously, and cold lotions applied to the head. After four injections the symptoms abated, and by the next day the patient had recovered. It is worth while to observe that a very complete account of atropine has been contributed to the 'Dictionnaire Encyclopédique des Sciences Médicales,' by MM. Lutz, Gobley, Gubler, and Orfila. These authors deal, in the order mentioned, with the chemical, pharmacological, therapeutical, and toxicological aspects of the drug. Dr. Meuriot* has published a treatise on the subject, and Mr. Soelberg Wells† has reviewed all the questions connected with the use of atropine in iritis.

Lachrymal obstructions have been the subject of pamphlets and papers. Dr. Stilling, of Hesse Cassel,‡ treats obstructions of the nasal duct by internal incisions. First slitting the canaliculus, he introduces a probe into the sac in the ordinary way, and carries it down to the stricture, to ascertain its situation and firmness. Then, withdrawing the probe, he uses instead of it a small knife made for the purpose,§ with a somewhat rounded point, and a blade increasing in width to the heel. This knife is pushed through the stricture and into the nose, and its edge is then made to divide the thickened tissues in several directions, up to the bony walls of the duct. No further treatment is usually needed. Dr. Ulrich Herzenstein‖ has attempted to accomplish the same complete division by splitting the stricture with an instrument that is a copy in miniature of that used by Mr. Barnard Holt for the urethra. He also employs lotions in very copious streams, by means of a kind of pump, connected by tubing with a canula capable of entering the duct. Warlomont¶ assists Stilling's treatment, in cases complicated with morbid states of the mucous membrane, by introducing, after the operation, and leaving for a time in the duct, stylets of a kind invented by Dr. Libbrecht, of Gand. These stylets are as thick as Bowman's No. 4 probe, four centimètres long, and furnished with a recurved upper portion. They have three or four longitudinal grooves down their whole length, and these form capillary channels, to guide along the passages any lotion that is put into the internal angle of the eye. The author recommends a solution of chloride of zinc, of from 3 to 5 parts in 500 parts of water, to be used three times a day, and advises the patients to sniff when the lotion is applied, in order to promote its passage along the duct. From fifteen to eighteen days will usually complete the cure. Prof. Alfred Graefe** advises excision of the caruncle in cases in which stricture has been dilated, disorder of the mucous membrane removed, and in which the tears still do not flow freely away. He believes that this organ is sometimes a mechanical impediment to their escape. Zehender††

* 'De la Methode physiologique et thérapeutique, et de ses applications à l'étude de la Belladone,' Paris, 1868.

† Op. cit., p. 154 et seq.

‡ 'Uber die Heilung der Verengerungen der Thränenwege,' Cassel, 1868.

§ May be obtained of Weiss and Son.

‖ 'Beitrage zur Physiologie und Therapie der Thränenorgane,' Berlin, 1868.

¶ 'Annales d'Oculistique,' 1868.

** 'Klin. Monatsbl.,' 1868. †† Ibid., 1867.

describes a case of complete congenital occlusion of both lachrymal puncta on the right side, and of the lower punctum on the left. Openings were made with a cataract needle, and then dilated, and a complete cure was the result.

The subject of conical cornea has received much attention from von Graefe, who has delivered a lecture before the Medical Society of Berlin,* in which he enters at great length into the pathology of the affection, and shows conclusively that this peculiar hyperboloid curvature (which is not really conical) is due to atrophy of the central portion of the membrane. He describes an ingenious manner of detecting the early stages of the affection. It follows from the change of curvature that the image reflected from the central portion of the cornea will be smaller than the images reflected from the lateral portions. If, therefore, a horizontal row of equal lights be placed before the eye, the smaller images of the central part of the row will contrast with the larger images of the lateral parts. Such a row of lights may be conveniently furnished by a series of equal and equidistant circular perforations in a plate of blackened metal, behind which is placed a slip of ground glass, and the whole illuminated by a lamp or gas-flame. Even in very early stages of the disease the difference in the sizes of the reflected images will be distinctly appreciable by the naked eye. The author then passes in review the various proposals that have been made for the treatment of the disease, and describes his own most recent method, which is as follows:—A portion of corneal tissue at the apex of the cone is shaved off with a fine cataract knife, without opening the anterior chamber, and the denuded surface is touched, at first very lightly, and only on alternate days, but afterwards, if necessary, more freely and more frequently, with diluted nitrate of silver. If no reaction should follow, a second bit of the cornea may be shaved off, and the caustic reapplied. When a central ulcer with a halo of infiltration is fairly established, the base of the ulcer is cautiously perforated with a blunt probe, and the perforation is two or three times repeated. The eye is then bound up, and the ulcer allowed to heal. The cicatrization will flatten the abnormal curvature; and, if the resulting leucoma be large, it may still be necessary to make an artificial pupil. The results in v. Graefe's hands have been excellent; and Meyer† also records a very successful case. Bader‡ mentions a case of successful abscission of the apex of the cone, the wound having been united by three sutures of fine silver wire. Dr. Ponti Floriano § publishes a case of double conical cornea, said to have been cured entirely by double irido-enkleisis. It is even stated that the natural curvature returned after the operations, and that the patient, who could only read, before treatment, No. 16 of Jäger with the right eye and No. 7 with the left, was restored to perfect vision. It is also said that among the remedies tried prior to operation was the "infusion of tobacco, so much extolled by the English." Prof. Zehender‖ relates a case of obstinate corneal fistula, which healed under the repeated application

* 'Annales d'Oculistique,' 1868.
† 'Gaz. des Hôpitaux,' 1868.
‡ Op. cit., p. 192.
§ 'Giornale d'Oftalmologia Italiano,' 1868.
‖ 'Klin. Monatsbl.,' 1868.

of Calabar bean to the eye, after all other treatment had failed. Professor Businelli, of Modena,* was consulted by a woman, æt. 60, the cornea of whose right eye was entirely covered by closely packed fleshy growths, rendered laterally polyhedral by mutual pressure, and rounded at their free extremities, the whole forming a tumour the size of a cherry. This condition had lasted for several years, and was three years under Businelli's observation before the patient would submit to any treatment. At length increasing inconvenience induced her to do so, and the growths were all removed, as close to the cornea as possible, by curved scissors and Desmarre's scarificator. Free bleeding occurred, but was soon checked. The after treatment consisted in the application of sulphate of copper, and in a few months the cornea was sufficiently transparent to allow of the perception of colours and of the recognition of the movements of the hand. Before the operation there had been only quantitative perception of light. The left eye was perfectly healthy. The case is probably unique. Dr. Luca† states that sulphate of soda, either in aqueous solution or in very fine powder, causes the disappearance, after a time more or less prolonged, of partial or even of total opacities of the cornea. Guyot‡ gives the following formula for points of diluted nitrate of silver:—Nitrate of silver two parts, nitrate and sulphate of potash of each one part. Fuse in a silver or platinum capsule, and cool in a mould of the same, well covered, so as to obtain the sticks white. For greater convenience of handling they may be coated with gutta percha, by dipping them into a weak solution of this substance in sulphuret of carbon. They are less deliquescent than the sticks diluted with nitrate of potash only.

Dr. Rudolph Schirmer has written§ upon iritis, and calls attention to loss of lustre of the iris as a valuable symptom of the earliest stages of the disease. He also advises the use of Calabar bean against posterior synechiæ that resist the action of atropine. Sichel,‖ in the course of some observations on points of ophthalmology, calls attention to certain states of the eye in which pressure with the finger on the globe will push the margin of the pupil towards its opposite margin, and thus render the pupil oval while the pressure is continued. He thinks this condition is usually associated with unnatural softness of the vitreous, and that it requires further investigation. Robert Houdin has invented an instrument for measuring the diameter of the pupil, but Fick¶ claims to have preceded him. Houdin's instrument, and others of his invention, were exhibited to the International Congress, and are described and figured in the 'Compte Rendu.' Dr. Cohn,** in the course of some inquiries, to which reference will be made hereafter, met with five case of partially persistent pupillary membrane. Mooren,†† Keyser,‡‡ Korn,§§ and Talko,‖‖ describe other cases. Businelli¶¶ describes a floating corpuscle that existed in the eye of a young

* 'Giornale d'Oftalmologia Italiano,' 1867.
† 'Gaz. des Hôpitaux,' 1867.
‡ 'Bull. de Thérapeutique,' 1867.
§ 'Klin. Monatsbl.,' 1867.
‖ 'Ann. d'Oculist.,' 1868.
¶ 'Klin. Monatsbl.,' 1868.
** Ibid., 1867.
†† Op. cit.
‡‡ 'Klin. Monatsbl.,' 1867.
§§ Ibid., 1867.
‖‖ Ibid., 1868.
¶¶ 'Giornale d'Oftalmologia Italiano,' 1867.

man, æt. 26, and that had much the appearance of a butterfly's egg. It was suspended by a delicate filament, studded with pigment, from the lower border of the pupil. It was broken in removal, but the author considered it to be a residuum of the fœtal pupillary membrane.

The relative merits of von Graefe's and of other methods of extracting senile cataract have occasioned lively controversy, and innumerable papers in English and foreign journals. Dr. F. P. Ferreira* has published an account of the linear method. Dr. Weckert has given to the world an essay on the new operations, but it is, in fact, little more than a description of them. Prof. von Hasner, of Prague,‡ has assailed von Graefe's method, the "modified linear extraction," in a pamphlet of extreme acerbity and bitterness; and von Graefe § has replied to the attack in a manner equally temperate and dignified. Von Hasner trusted to invective rather than to evidence; and there would be no advantage in reproducing here a controversy that was almost entirely personal, and that will have little or no influence upon the ultimate verdict of the profession upon the subject. Dr. Steffan,‖ of Frankfort-on-the-Maine, has published his own experiences and researches in a manner requiring a more extended notice. He commenced independent practice as an oculist in 1861. The treatise of Schuft had then just appeared, advocating his method of scoop extraction. Von Graefe had been led to the linear section, because he considered the flap to be in itself a source of danger. Steffan determined to adopt Schuft's method, and practised it in 27 cases, which led him to results perhaps all the more valuable because the smallness of the number was favorable to careful and continued observation. He departed in two respects from Schuft's procedure. Except in 3 cases, he made the iridectomy before extraction. The section was $3\frac{1}{2}$ or 4 lines long instead of 3, a change that could not fail to render the results more favorable. The operation was well completed 19 times. In 5 cases an escape of vitreous followed the lens. Twice, portions of the cortex were left behind. Once, vitreous escaped with the lens and with the remains of cortex. Of 14 operations completed without accident, 11 patients read No. 1 (Jäger), one No. 4, one No. 15 (pre-existent amblyopia and strabismus), and one could only count fingers (pre-existent disseminated choroiditis and myopia). The other 13 operations were followed by inflammation. Five patients were enabled by a subsequent iridectomy to read at least No. 15; 4 had only quantitative perception of light, and 4 were perfectly blind. There were thus 8 complete failures in 27 cases, or 29·6 per cent. Results so unfortunate had determined the author to practise flap extraction, when he became acquainted with the writings of Messrs. Bowman and Critchett. The English method offered two positive advantages, a

* 'De l'Opération de la Cataracte, par l'extraction linéare scleroticale,' Paris, 1867.

† 'Des Nouveaux Procédés Operatoires de la Cataracte. Parallèle et Critique.' Paris, 1868.

‡ 'Die neueste Phase der Staar-operation,' Prag., 1868.

§ 'Klin. Monatsbl.,' 1868; 'Annales d'Oculistique,' 1868.

‖ 'Erfahrungen und Studien über die Staar-operation, im Zeitraum der Jahre 1861—1867,' Erlangen, 1867.

larger section ($4\frac{1}{2}$ to 5 lines), and a smaller scoop. Bowman's results were 8·4 per cent. of failures, and a further 9 per cent. of defective cures. Von Graefe obtained, by Critchett's method, in 118 cases, 7 complete failures, and 4 others nearly complete; while in 1600 flap extractions he had had 7 per cent. of failures, and since his use of the compressive bandage only 5 per cent. Dr. Steffan practised Critchett's operation in 13 cases of senile cataracts with hard nuclei, 3 times with concomitant iridectomy, 9 times with iridectomy at least six weeks before extraction. The operation was normal nine times; twice there was escape of vitreous, once before the lens, once following it. In 2 cases portions of cortex were left behind. The recovery was uninterrupted in 7 cases, and in 6 there was inflammation. Six patients were enabled to read No. 1, one No. 6; one gained nothing, on account of atrophy of the optic nerve, although the operation succeeded surgically; 3 were conducted to a moderately good result by consecutive iridectomy; and in 2 the operation was useless. These results, together with his investigations, caused the author to fall back definitely upon flap extraction.

In order that a senile cataract may not injure, in its passage, the lips of the section, it is necessary for this to have a form and extent in accordance with that of the nucleus to be removed. Daviel (1747) took two thirds of the circumference of the cornea. Richter, about 1770, had the merit of fixing the extent at that of half the circumference, a rule that the most eminent practitioners have observed down to our own day. Arlt was the first who gave (1850) precise measurements of the cornea, of the section, of the thickness of the cornea, and of the size of a normal lens. Writers following Arlt, and giving linear dimensions, omitted all mention of the thickness of the lens. Dr. Steffan sought to supply the omission by measuring the nuclei of 20 cataracts. He found as a maximum a diameter of from $3\frac{3}{4}$ to 4 lines, and an axial thickness of from $1\frac{3}{4}$ to 2 lines, so that a hard cataract may be of dimensions equal to those of a normal lens. This happens in cataracts with horny cortex, and also in complete cataracts with tardy softening. Such cases are met with in advanced life, towards the seventieth year. Most of the nuclei of hard cataracts have mean dimensions from 3 to $3\frac{1}{2}$ lines of diameter, from 1 to $1\frac{1}{2}$ of thickness. Small nuclei, of less diameter than 3 lines and less thickness than 1 line, are uncommon and difficult to diagnosticate. Thus the thickness of a cataract is nearly half its diameter, and should be taken into account in the corneal section.

On considering what occurs at the time of exit of the lens from the eye, it becomes evident that the flap should have a height at least equal to the thickness of the cataract; and since the thickness of the cornea makes the internal wound smaller than the external, the puncture and counter-puncture should fall at least half a line outside of the transparent corneal margin. Only under such conditions can the cataract escape without injury to the lips of the wound. It is also evident that the convex part of the section should reach at least to the corneal margin, for an incision directed forwards, and for a cataract of maximum size. It might fall a little within the cornea if the size of the

cataract were less. Since the author has adopted this manner of operating, his success has been more uniform than he could have hoped. He finds no source of danger in the flap itself, and therefore cannot assent to the principle on which von Graefe based his linear section. The flap may produce suppuration, but so also may the linear section, or even a puncture or abrasion of the cornea. In nineteen operations without chloroform, and with iridectomy, either prior to or at the same time as the extraction, only once was there any complication. The section had been made too small, and it was necessary to extract the lens with Critchett's scoop. Escape of vitreous and some bruising of the iris were followed by irido-choroiditis and atrophy. In 4 cases there was slight irritation, with formation of secondary cataract. Fourteen patients read No. 1, one read No. 4, and three read only large type. These were cases of pre-existent irido-cyclitis.

In considering the sections adopted by different authors, Steffan observes that the height of the flap is commonly sufficient, but its base too narrow. The improvement of placing the section outside the cornea is due to Jacobson; but the influence attributed to marasmus is probably due to want of correspondence between the extent of the section and the size of the cataract. Corneal wounds, if cleanly cut, heal as well as wounds in the sclerotic, but only in the sclerotic can perfect cleanness be ensured.

With regard to the value of linear corneal sections in hard cataract, Steffan points out that Schuft employed a section having three lines of external length. How could a cataract of mean dimensions (3 to $3\frac{1}{2}$ lines in diameter and 1 to $1\frac{1}{2}$ in thickness), supported by a bulky scoop, be removed through such an opening without injury? It is not surprising that Mooren lost 31·25 per cent. of his cases, and Steffan himself 29·6 per cent., although his section extended to a fourth of the circumference of the cornea, that is, to an external length of $3\frac{1}{2}$ or 4 lines, and an internal length of 3 lines. Such a section might suffice for small cataracts, but how can we ascertain the size with certainty? It is always a necessary precaution to make a somewhat larger section than the cataract seems to demand. Bowman and Critchett, indeed, make a section $4\frac{1}{2}$ or 5 lines long externally, and $3\frac{3}{4}$ or 4 internally, corresponding to the diameter of large nuclei; but the axial thickness, in passing through the wound, shortens the section. It is, therefore, not surprising that those who have followed this method have lost many cases. It is the same with von Graefe's section. Its length, $4\frac{1}{2}$ or $4\frac{3}{4}$ lines externally, 4 lines internally, will not permit the easy passage of a nucleus of from 3 to 4 lines in diameter and from 1 to 2 lines in thickness. V. Graefe, however, now attaches great importance to the exit of the lens by pressure alone, without the introduction of a traction instrument. He prescribes a height of half a line for the flap, if it be wished to pass such an instrument, in cases where the lens cannot be made to glide out; but he condemns the principle of giving greater height to the flap as a means of avoiding contusion. Steffan differs from him upon this point, and believes that this contusion is fraught with evils. He gives the flap a height commensurate with the thickness of the cataract.

In order to make the flap easily and with safety, it is necessary that, after puncture and counter-puncture, the simple advancement of the knife should give the desired section. It is therefore necessary that the blade should increase regularly from point to base, to avoid any loss of aqueous; that the back should be thin, but blunt, in a straight line; and that the point should be two-edged. These conditions were clearly stated by Richter in 1773. He fixed the maximum of width at 3 lines, or half the corneal diameter. His knife is figured with a cutting edge slightly convex, but this is not mentioned in the description. Zehender* has supplied the deficiency, and has described the best possible knife, except that its dimensions are fixed arbitrarily. The width of the knife should depend upon the height of the flap, estimated from the exterior when the section is made at one *coup*, and from the interior when a bridge of tissue is left at the summit for division during the withdrawal of the blade. This method is considered by Steffan to be the safest; and he therefore recommends a width of blade of from $1\frac{1}{2}$ to 2 lines for cataracts of the same thickness. With this he obtains a section of proper size interiorly, and divides the central bridge in drawing back the knife, with its edge directed somewhat forward. The aqueous humour is thus permitted to escape gradually, and the section is completely under a minimum of intra-ocular pressure. Either Zehender's knife may be used, with its width diminished to $1\frac{1}{2}$ or 2 lines, or von Graefe's, increased to the same dimensions.

With regard to the conjunctival flap, Steffan thinks that it occasions hæmorrhage, and that it is of no value in preventing suppuration.

That the performance of iridectomy should be the rule will be manifest if we consider the distension of the pupil required for the passage of the nucleus. Atropine cannot prevent bruising, because the pupil always contracts as the aqueous humour escapes. Moreover, the sphincter causes the iris to retain portions of cortex, and also to conceal them. All these inconveniences are avoided by an iridectomy made prior to the exit of the lens, and either as part of the extraction or six weeks earlier. Steffan sees no objection to combining the two procedures, and thus avoiding the risk of any want of correspondence between the size of the artificial pupil and that of the cataract. He sees no danger in the passage of the lens over the freshly cut surfaces of the iris.

With regard to pathological deposits in the capsule after extraction, Steffan dissents entirely from von Graefe's view that they depend upon a proliferation of intra-capsular cells. He refers them entirely to irritation of the iris, saying that no iridectomy will permit the passage of the nucleus wholly without bruising; and that hence arises an exudation which, together with the remains of cortex and fragments of coagula, suffices to explain the presence of the fine membranes that form secondary cataract. He objects to the systematic removal of the capsule, notwithstanding the experience of Wecker and of Pagenstecher, and thinks that the excellent vision obtained in successful cases does not justify the surgeon in incurring the risks of the method. If it be important to get rid of capsule, he prefers to open the posterior capsule, after the manner of von Hasner, after the exit of the lens.

* 'Ophthalmic Review,' April, 1864.

Upon the question of the use of chloroform, Steffan agrees with Jacobson that it may be given with perfect safety. But he does not think it at all essential to success, except in unsteady patients, or in dealing with diseased, restless, or hypersensitive eyes.

Prof. Knapp* reports 100 cases of cataract operated upon after the method of von Graefe. He made his section larger or smaller, according to the size and hardness of the nucleus; and his largest sections approached more nearly to the flap than von Graefe thinks necessary, but were kept entirely within the limit of the scleral margin. An incision too much removed from the cornea was found to expose the zonula to danger; one too near the cornea did not close perfectly, and was exposed to risk of primary suppuration, which occurred in one case. Since then, the section was made near the iris at its extremities, and with its centre distant from $\frac{1}{2}$ to 1 millimètre from the cornea. The preservation of a conjunctival flap appeared to promote the cure. A slight disadvantage of the section in the sclerotic was the bleeding from its edges; and the author turns the flap of conjunctiva over the cornea, in order to avoid the entrance of blood into the eye, and stops proceedings until bleeding has ceased. The iridectomy and the opening of the capsule were performed after von Graefe's methods, except that, as sometimes the cystitome depressed very hard lenses and ruptured the zonula, Knapp has attempted to open the capsule prior to the iridectomy. The advantages of this are that there is no transference of the fixation forceps to an assistant, that the iris guards the zonula, that hæmorrhage from the cut iris occurring after the capsule is open does not retard the operation, and that the blood escapes with the lens. The disadvantages are the difficulty of gliding the cystitome between the iris and the lens without wounding the former or dragging the latter, that the capsular opening is neither so complete nor so peripheral, and that the exit of the lens is more difficult. The division of the capsule is very important; and, if insufficient, involves risk of escape of vitreous and of retention of cortical substance, with consequent inflammation and secondary cataract. To extract the lens Knapp removes the wire speculum, and by a little patience accustoms the eye to the touch of the curette, which is large and with thin edges. It is applied over the posterior margin of the wound; but if the zonula projects, or the lens does not escape easily, the curette is made to enter the wound somewhat, and to cover the zonula. The lens then escapes, perhaps by the aid of a little pressure through the lower eyelids. It is necessary to avoid squeezing the iris. This method preserves the vitreous, and is to be preferred to the use of von Graefe's hook, which holds badly. The entrance of a scoop, as practised by Bowman and Critchett, is not to be recommended as an ordinary procedure, since the lens will escape without it in 75 cases out of 100. Sometimes the lens has been removed in its capsule, either involuntarily or by design. The progress in these cases has been normal, and there was no great loss of vitreous. The attempt is indicated when the zonula is torn or destroyed, and it is probable that in very hard cataracts this may be

* 'Archiv für Ophthalmologie,' xiii, 1.

the case; but the method is not to be accepted, as by Pagenstecher, for general use. Removal of cortical remains was accomplished by careful friction through the eyelids, and, if the hyaloid was not broken, needed only time and patience. Such manœuvres never produced inflammation, but remains of cortex nearly always impeded recovery. If the hyaloid were ruptured, only experience could teach how much vitreous might be suffered to escape in order to obtain the benefit of complete removal of all cortical fragments. In the 100 operations, 71 were entirely normal, and in 29 there were various accidents or complications. In 74 cases the recovery was normal. Of the 100 cataracts, 70 were hard, 8 not hard, 9 very hard, and 13 complicated. Of the 70 hard cataracts, vision ranged from 1 to $\frac{1}{10}$ in 58, from $\frac{1}{10}$ to $\frac{1}{200}$ in 8, was only qualitative perception of light in 3, and was wholly lost in 1. Of the 8 cataracts not hard, vision ranged from 1 to $\frac{1}{10}$ in 5, from $\frac{1}{11}$ to $\frac{1}{200}$ in 2, and was lost in 1. Of the 9 very hard, from 1 to $\frac{1}{10}$ in 8, from $\frac{1}{11}$ to $\frac{1}{200}$ in 1. Of the 13 complicated, from 1 to $\frac{1}{10}$ in 1, from $\frac{1}{11}$ to $\frac{1}{200}$ in 7, and in 5 was reduced to quantitative perception of light. It was often found that vision could be much improved by a cylindrical lens.

The same author* subsequently reports a second series of 100 operations. Partly from his own experience, and partly from the statistics of others, he arrives at the conclusion that, while an incision in the sclerotic heals better than one in the cornea, yet that the former involves greater danger of loss of vitreous, especially at the centre of the section. In order to steer between these dangers, he advises that the puncture and counter-puncture should be as far back as the attachments of the iris will allow, but that the centre of the section should not be more than half a line from the margin of the cornea. The ultimate result of the second hundred cases is stated to be—2 lost eyes, 5 imperfect cures, 93 perfect.

Dr. Ferd. Bergmann† gives the particulars of 13 cases of extraction of cataract, with its capsule, witnessed by him in the clinique of Dr. Knapp. He states that escape of the vitreous humour is less common than would be expected, or than was stated by Pagenstecher himself; and that profound chloroformization is not indispensable. Dr. Knapp has had but one case in which the loss of vitreous was considerable, and three more in which it was small. A more important accident, rupture of the capsule with escape of cortex, happened four times, and was always followed by inflammation. In 9 cases there was secondary hæmorrhage into the anterior chamber, and in 2, hæmorrhage into the vitreous. The resulting acuteness of vision was not greater than by other methods, and the author concludes that the operation is not indicated for any but very hard cataracts, attended by some thickening of the anterior capsule.

Von Graefe‡ refers to his formerly expressed opinion that it would not be practicable altogether to lay aside traction instruments, in spite of their inconveniences. He still maintains this opinion as far as the plan of extraction then employed is concerned. This, the *Schlitten*

* 'Archiv für Ophthalmologie,' xiv, 1. † Ibid., xiii, 2. ‡ Ibid.

manœuvre, consisted in depressing the scleral border of the section while counter-pressure was made by the fixation forceps. This counter-pressure could not follow the lens on its exit, because the forceps was fixed, or at least the pressure required to be increased in a dangerous degree to attain such an end. By making the point of counter-pressure follow the escaping lens, many inconveniences are avoided; and for this purpose v. Graefe has devised the following method:

The first three stages of the operation are performed in the same manner as formerly, but the fixation forceps is applied to a point a line or a line and a half on the nasal side of the vertical meridian. A spoon of hard vulcanite, with a rounded back, is applied with this back against the lower margin of the cornea, and rotated on its axis by a half turn, so that its cavity looks upwards and forwards. In this position, and with a steady pressure directed, in the first instance, towards the centre of the eyeball, the spoon is made to execute a slight movement of pushing upwards, to the extent of about half a line along the base of the cornea. During this the upper edge of the lens advances into the gaping wound. The pressure towards the centre of the eye is continued for a while, and, as the lens escapes, the direction of pressure is gradually changed, so as to become more tangential to the cornea, while the spoon itself is caused to glide upwards after the cataract, which is thus pushed out before it. When the greater part has passed through the wound the rest may be eased out by the spoon; or, what is better, the spoon may be used as before to propel fragments of cortex. It is very important that the original pressure should not be changed too soon into the tangential movement, since by doing so the inferior portions of cortex would be separated. The eyelid speculum and the fixation forceps remain in place until the operation is completed. The degree of pressure must be in an inverse ratio to the natural tension of the eye, and in collapse of the cornea the spoon may be pressed into the hollow without danger.

The author states that during the eight months preceding the date of his paper he has operated on 230 cataracts in this manner. In only 2 cases was any traction instrument required (once from smallness of the wound, and once on account of premature recovery from anæsthesia). Loss of vitreous took place only in 9 cases, and in 3 of these before the completion of the section. The cortex was removed entirely without any friction through the eyelids. Careful observation showed that the cornea was in no way injured by the pressure. In 28 cases it had been considerable in degree, and in 7 very considerable. Of these 7 cases all did well. In 3 of the 28 the healing was disturbed, with finally one good result, one half result, and one doubtful. Since the adoption of this method the section has been finished in a rather more oblique direction, from which a better closure of the wound is obtained.

The author now recommends a somewhat larger section, reaching to five lines of external measurement; and that the iris, especially in soft eyes, should still be excised quite up to the corners of the wound. The results of the cases are said to have been very favorable, but the number, 230, is not enough to be of statistical value.

Dr. Charles Taylor* and Dr. Wolfe† have each devised and carried out modifications of which they speak very favorably. Dr. Küchler, of Darmstadt,‡ has suggested a very curious and probably quite original method of extraction, which appears to be compounded, in his mind, of the phenomena of parturition and the method of removing tumours. He divides the cornea through its horizonzal meridian, from side to side, lacerates the capsule in the ordinary way, presses out the nucleus and cortex, and then binds up both eyes and the head generally in a bandage 10 yards long, stiffened with plaster of Paris, which remains undisturbed for six or seven days. He states that his results are excellent, and that the horizontal cicatrix neither distorts the curvature of the cornea nor forms any impediment to vision. His lengthy pamphlet is a curious illustration of how much may be said in favour of a proposal about which it is difficult to write seriously.

Businelli§ relates an instance in which the nucleus of the crystalline lens, six years after its depression, passed through the pupil into the anterior chamber, and occasioned considerable irritation. By the use of atropine, absolute rest of the eyes, and cold compresses, the irritation subsided in the course of three weeks, and vision remained unimpaired. Eight months later the nucleus was still in its new position. The patient was a woman 74 years of age.

The whole subject of cataract has been carefully treated by the late Prof. Foucher, whose posthumous work‖ has been edited by MM. Bousseau et Vassin. Mr. Soelberg Wells¶ has given an account of the relative merits of different operations. Esslinger** has also written upon the question, and the debates of the International Congress of 1867 may be referred to.

Before leaving the subject I may add that Knapp†† advises the employment of artificial lateral illumination during operations upon the eye, and especially on capsule and secondary cataract.

M. Daviers, of Angers,‡‡ has invented a pair of fixation forceps intended to hold the eye during operations without dragging upon or tearing the conjunctiva. The points of the forceps, very fine and sharp, cross one another for a short distance, and are intended to pierce (but not to perforate) the sclerotic, so as to gain their hold on its firm fibrous tissue.

Mr. Bader§§ has also described and figured a similar instrument.

Dr. Noyes, of New York, has invented a much improved instrument for holding apart the eyelids during operations. The wire retractors work with a rack and pinion, on an arc of aluminium, and are perfectly steady at whatever distance apart.

Injuries of the eyeball have received their full share of attention.

* "On an Improved Method of Extracting in Cases of Cataract." 'Edin. Med. Journal,' 1868; and reprinted.

† "An Improved Method of Extraction of Cataract," 'Lancet,' 1868; and reprinted.

‡ 'Die Querextraction des grauen Staars der Erwachsenen. Enke,' Erlangen, 1868.

§ 'Giornale d'Oftalmologia Italiano,' 1867.

‖ 'Leçons sur la Cataracte,' Paris, 1868.

¶ Op. cit.

** 'Klin. Monatsbl.,' 1868.

†† 'Archiv f. Ophth.,' xiv, 1.

‡‡ 'Annales d'Oculistique,' 1868.

§§ 'Lancet,' 1868, ii, p. 566.

Dr. Berlin,* among 7573 cases of eye affection, in the course of five years, saw 26 cases in which foreign bodies had penetrated the vitreous, five in which the body was in the iris, and four in which it was in the lens. The intruding substance was discovered in 11 cases after enucleation, twice by the ophthalmoscope, once by the unaided eye, and twice by its extraction. The diagnosis rested either on direct evidence or on the history and attendant symptoms. The largest substance found was a pellet of lead, $3\frac{1}{4}$ lines in diameter. The author analyses the symptoms, and mentions any that were important. Detachment of the retina might be produced primarily by sub-retinal hæmorrhage and consecutive exudation; or, secondarily, by retraction either of the altered vitreous, or of a sclerotic cicatrix. It may also happen in a third manner, analogous to that which has been observed by Sämisch, after rupture of the choroid. This form of detachment appears only some months after the injury, and is a slow but direct effect of a wound of the posterior segment of the eye. Five cases are cited in support of this opinion. In 11 cases in which the author followed the course of the foreign body there were 9 in which it had reached the posterior segment of the eyeballs. Among these were 3 in which it had rested imbedded, and 6 in which it had rebounded. In the other 2 it remained in the sclerotic wound. In the 9 cases the posterior wound was on the same level with, or more elevated than, the anterior wound; and in 2 cases, in which the cornea, lens, and retina, were all traversed, the three wounds were in a straight line. The foreign body was twice observed to retraverse the vitreous by reflection, so as to be near the lens. The number of the cases was too small to allow of a conclusion as to any influence of the course of the foreign body in the production of sympathetic ophthalmia, but the other eye was sympathetically affected five times out of the twenty-six. Dr. Schiess-Gemuseus† details his experiments on the eyes of three rabbits, into which he introduced respectively pieces of iron, of wood, and of caustic, through wounds in the sclerotic. All the eyes underwent rapid and complete disorganization, with detachment of the retina, but the details are of little interest. Lubinsky‡ records experiments on the eyes of rabbits in order to study the healing process after wounds.

Dr. Schiess-Gemuseus§ relates also 2 remarkable cases of injury to the eye. In the first the patient received a severe blow from a piece of iron. When seen, four days afterwards, there was a horizontal wound of cornea and sclerotic, $4\frac{1}{2}$ lines in length. The lens and its capsule, and nearly all the iris, had disappeared. The wound healed favorably, and so much vision was preserved that fingers could be counted at 8′, and large objects recognised by the aid of a convex lens. The second patient was a boy of 13, who exploded some gunpowder in a glass flask, and was wounded by fragments. On the following day the author found an oblique, nearly horizontal, incised wound, commencing in the cornea, and a centimètre and a half in length, extending along the sclerotic on the nasal side. From this wound a piece of glass was removed, and another from the conjunctival sac. In the sclerotic, at the

* 'Archiv f. Ophthalmol.,' xiii, 2. † Ibid. ‡ Ibid.
§ 'Klin. Monatsbl.,' 1867.

outer side, was another wound, one centimètre long, dividing the tunic entirely, and allowing the choroid to be seen. Both incisions healed perfectly, and no impairment of vision was produced. Professor B. von Langenbeck* describes the case of a railway guard, who was bruised between a tender and a locomotive, receiving the shock on the right side of his face. The upper eyelid was torn transversely and horizontally, and detached as far as the outer border of the orbit. The lower lid was separated from the internal palpebral ligament. A deep wound extended from the internal canthus to the upper lip. The eye had disappeared, the nose was flattened and turned to the left. Seven days after the injury, the swelling having subsided, the eye was discovered to be dislocated into the antrum, through an opening large enough to admit a finger, and with the cornea downwards. The eye was replaced, and sight was retained. In two months cicatrization had so altered the position of the eyelids that they covered the eye entirely, although its vision and movements were retained. A plastic operation restored the eyelids to their place and their mobility; but, eighteen days later, the eye became painful, and the cornea suppurated. Dr. Paul Schroeter† has met with a case of traumatic anæsthesia of the retina in a schoolboy 15 years old. The patient received a slight wound over the right cornea from a splinter of iron, and was the subject of small congenital cataract in both eyes. The corneal wound soon healed, but the boy complained of great impairment of sight in the eye. The acuteness of vision was found to be reduced to 1·200th, and the diameter of the field of vision, taken at 18 inches, to 4 or 5 inches. Through light blue glass the vision increased to 1·10th, and the diameter of the field to 10 or 12 inches. The phosphenes were perfect in the equatorial region. The ophthalmoscope showed only the central vessels, especially the veins, very full, and this condition was present in a less degree in the other eye. The treatment consisted of the exclusion of light, by a bandage or by a dark room, nourishing diet, and lactate of zinc. In ten days recovery was far advanced. The author attributed the loss of sight, not to the corneal wound, but entirely to the concussion of the eyeball, and suggests that the dilatation of the retinal vessels supports v. Graëfe's hypothesis of the influence of the vaso-motor nerves in such conditions.

Dr. Joseph Talko,‡ of Tiflis, relates a case of traumatic anæsthesia of the retina in a young soldier. The patient received the discharge of a gun, loaded with a mixture of powder and sand, in his face, from a distance of four feet. His cheek was burned, the left cornea slightly abraded, and the sight of the left eye wholly lost. He was treated by the subcutaneous injection of a solution of nitrate of strychnia, and made a good recovery. A case of traumatic rupture of the iris and retina is recorded by Dr. Dohmen,§ and one of traumatic rupture of the retina and choroid by Dr. Sämisch,‖ whose patient, a carpenter, received a blow on the head and cheek from the strap of a steam engine. His sight remaining impaired on that side after other symptoms had subsided, an ophthalmoscopic examination was made, and discovered several rents in the retina and choroid near the equator, at the lower and

* 'Archiv f. Ophth.,' xiii, 2. † 'Klin. Monatsbl.,' 1867.
‡ Ibid., 1868. § Ibid., 1867. ‖ Ibid.

outer part of the globe, with effusions of blood around them. Sight was gradually restored. An injury, probably unique, is chronicled by M. Herrgott.* He records the case of an epileptic idiot girl, 18 years old, who was attacked by a fit while turning the handle of a door. She fell upon the loop of the key, and from thence to the ground, leaving her right eye in the key. The optic nerve and the blood-vessels were torn through at the level of the globe, the muscles at a few millimètres from their points of insertion, and a few ragged flaps of conjunctiva surrounded the cornea. The patient appeared to suffer little or no pain, and her recovery was rapid and complete.

Dr. Edouard Meyer† has divided the ciliary nerves leading from the injured portion of an eye, hoping thereby to prevent sympathetic ophthalmia, without enucleation. He would have recourse to this proceeding whenever any part of the ciliary region of an injured eye is permanently tender, or when any threatening of sympathetic irritation or of sympathetic ophthalmia appears in its fellow. He raises a fold of conjunctiva over the tender part, and divides it by scissors, then passes a strabismus hook under the nearest rectus tendon, as a means of fixing the eyeball, and transfixes the sclerotic behind the tender part by puncture and counter-puncture, with a narrow straight knife, which is made to cut its way out. The eyelids are then closed with compress and bandage. The direction of the sclerotic wound should be parallel with the corneal margin, its extent must be regulated by the extent of tenderness, and care must be taken to avoid the crystalline lens. It may be necessary to excise protruding vitreous, and to continue the bandage for some days or a week. Dr. Meyer reports three successful operations, and Mr. J. Z. Laurence‡ and Dr. Secondi§ have each operated once with advantage. Mr. Lawson‖ enters into full detail with regard to the effects of injury upon the eye and upon its fellow, and with respect to the diagnosis and treatment of such cases. Mr. Soelberg Wells¶ also affords copious information upon the subject.

The contributions to our knowledge of the disorders of the ocular muscles have not been numerous. Javal** continues to record cases in which his stereoscopic exercises have restored perfect binocular vision in patients who had been operated upon for strabismus, with good cosmetic effect. He expresses his belief that the cause of strabismus is to be found in enfeebled accommodation rather than in hypermetropic refraction *per se*, and states that recent cases may often be completely cured by absolute exclusion of the worst eye from vision for a few weeks. A disc is to be bound over the eye and worn constantly. In one case he found that the degree of deviation of the squinting eye was precisely sufficient to bring its blind spot opposite the point of fixation of the other eye, and thus to avoid double images. This may be tested by telling the patient to fix the perforation of the ophthalmoscopic mirror with which the surgeon looks at the squinting eye. It shows a sensitiveness to double images, and augurs well for the success of treatment. The same author has more recently published an important essay on

* 'Gaz. Méd. de Strasbourg,' 1867.
† 'Annales d'Oculistique,' 1867.
‡ 'Lancet,' 1868, ii, pp. 633, 784.
§ 'Giorn. d'Oftal. Italiano,' 1868, p. 105.
‖ Op. cit.
¶ Op. cit.
** 'Annales d'Oculistique,' 1867.

strabismus* in its applications to the physiology of vision, especially in relation to the cases in which diplopia did not exist during strabismus, but supervenes after tenotomy. Dr. Schweigger† has also written upon squint.

Dr. Kugel‡ has studied the causes and treatment of nystagmus. He divides cases of nystagmus into three classes. In the first class he places those that date from early infancy, in which, he says, there is always some pathological state of the refracting media of the eye. This state may be (*a*) turbidity of the media, (*b*) a high degree of regular hypermetropic astigmatism combined with irregular astigmatism, or (*c*) a high degree of myopia of both eyes. In these cases the author believes the retinal image is not sufficiently clear and precise to be the originator of any definite reflex movement of direction. The second class comprises cases in which the nystagmus coexists with some disease of the fundus of the eye (irido-choroiditis), recognisable by its special signs. Such cases never date from infancy. Kugel explains them by supposing that disease has reduced the normal acuteness of the macula lutea to that of the parts around it, and that thus the natural stimulus to fixation, the clearer character of central vision, is taken away. The third class he attributes to insufficiency of the muscles of the eye, and chiefly of the internal recti and the muscle of accommodation. As regards treatment, cases of the third class may, he says, be easily cured, either by prismatic or by convex spectacles. In cases of the second class he advises the use of any surgical, or medical, or optical means by which vision may be improved; and cases of the third class are scarcely within the reach of treatment.

Dr. Schiess-Gemuseus records§ a case of periodic diplopia cured by displacement backwards of both internal recti. Dr. Dor‖ calls attention to the frequency with which paralysis of accommodation occurs after diphtheria, and relates cases. He believes that the nature of the affection has in some cases been wholly overlooked; and that instances of so-called "diphtheritic amaurosis" have depended solely on paralysed accommodation, which, in hypermetropic eyes, would destroy clear vision for distant objects as well as for near ones. In Dr. Dor's cases the mobility of the pupil was retained, thus showing that the movements of the iris are independent of those of the tensor choroidæ. The patients greatly improved under treatment by bromide of potassium and sulphate of quinine.

(*c*) *Medicine.*

Cases of amaurosis from lead poisoning have been observed by Dr. E. Meyer¶ in two sisters employed at Brussels in bleaching lace with the aid of white lead. In the first case the girl was attacked by colic at the age of nineteen, and afterwards became hemiplegic on the right side. From this she perfectly recovered, but her sight gradually

* 'Du Strabisme dans ses applications à la Physiologie de la Vision,' Paris, 1868.
† 'Klin. Monatsbl.,' 1867.
‡ 'Archiv für Ophthalmologie,' xiii, 2; and 'Annales d'Oculistique,' 1868.
§ 'Klin. Monatsbl.,' 1867. ‖ 'Annales d'Oculistique,' 1868.
¶ 'Union Médicale,' 1868.

failed, and in the course of four months she became perfectly blind. When the author first saw her the optic discs were in a state of complete white atrophy. The second sister, when twenty years old, suddenly fell down unconscious, and was convulsed. On recovery her mind was confused and her speech embarrassed. Another attack occurred a few hours later, and was followed by deep sleep. On awaking she complained of severe headache, and of a constantly thickening mist before her sight. On the day following she described herself as being blind, but when Dr. Meyer visited her two days later she could see the glimmer of a lamp two yards distant. The field of vision, tested by means of two candles, was considerably, but irregularly, contracted. The pupils were largely dilated. The ophthalmoscope showed the optic discs much swollen, elevated, opaque, and of a reddish-grey colour. The retina near the disc was opaque; the veins were large, flexuous, and deeply coloured; the arteries fine. The conditions were precisely those described by von Graefe as due to neuritis from obstruction to the circulation by constriction in the sclerotic ring.

After a treatment by cold applications to the head, sinapisms to the legs, free purging, and the application of Heurteloup's leech to the temples, the case eventually terminated in recovery, the retina and discs regaining nearly their normal aspect, and the patient being able to read No 10 of Jäger. The author concludes his report by some general observations on the affections of the eyes produced by lead poisoning.

Dr. Haase* reports from the Wiesbaden Eye Hospital a case of blindness from lead poisoning, in which speedy recovery followed the use of daily subcutaneous injections of morphia.

Under the name of retinitis nyctalopica Arlt† describes a disorder characterised by impairment of vision, with dazzling by ordinary daylight. He prescribes rest of the eyes, a dimly lighted chamber, blue spectacles for out-door exercise, cooling derivatives, leeching behind the ears, and a course of mercury followed by iodide of potassium. Of 33 cases, 17 recovered, 9 improved, the rest remained stationary. M. Martialis‡ has written a memoir to show that, in most cases, hemeralopia is caused by a serous effusion, the result of retino-choroiditis, and that the aggravation of this condition may produce in the optic nerve and its expansion all the disorders observed in exudative retinitis. He describes the anatomical lesions in the manner following:—In the most simple cases, when the malady lasts only a day or two, and may be compared to the disturbance of vision that is produced by passing from a light to a darker place, no lesion can be observed; there is only a molecular perturbation, a temporary stimulation that destroys for a time the keenness of the sense, and acts on the retina like a penetrating odour on the olfactory nerves, when it masks sensations of a less degree of intensity. Still, the nocturnal dilatation of the pupil is even then observable. In a more advanced stage the retina loses its transparency, not immediately in its whole extent, save in very exceptional cases, of which the author has seen only two, but in irre-

* 'Klin. Monatsbl.,' 1867.

† 'Bericht über die Augenklinik der Wiener Universität,' 1867.

‡ 'Archives de Médecine Navale,' 1868.

gular patches, sending forth prolongations along the vessels, especially the veins, the walls of which appear to be the source of the serous transudation, which at last involves the entire retina and compresses the bacillary layer. By this time the acuteness of vision is no longer complete during the day; there is amblyopia, and the patient, carefully interrogated, will describe many variations in his state. Subjective examination of the retina and of the visual field, and trials with Jaeger's scale, will suffice to show the mischief that is in progress. At the same time the circulatory system appears distended, and the optic disc, within the limits of its vascular supply, shares in the congestion, assuming sometimes a roseate tint. It is curious to follow the different phases presented by the retinal vessels when the disease continues or gets worse. The venous system shows them most plainly; because, while the arteries, surrounded by the exudative secretion, diminish in calibre, lose their branches, and at last disappear by atrophy, the veins pass from a state of tension to hypostasis, their calibre increases, their flexuosity becomes such that some of them appear as if beaded, and the course of the blood, less and less regular, is at last interrupted by hæmorrhages that may be seen with the ophthalmoscope, such as are observed in other affections characterised by obstruction of the vascular current. Changes still more profound follow, and lead on to atrophy and degeneration of the retina and of the choroid. Twenty-four cases of hemeralopia are also recorded by João de Lacerda.*

The subject of the changes produced in the internal tunics of the eye in persons of tuberculous diathesis has been investigated by various authors. Galezowski,† after calling attention to the fact that general conditions of the organism may affect the eyes and vision injuriously, observes that the tubercular diathesis has not been sufficiently studied in this respect. His ophthalmoscopic researches have enabled him to observe during life, in general tuberculization, certain changes in the retina and the choroid, occasioning disturbances of vision which, in the phthisical, assume three forms—1, changes in the nutrition of the retina; 2, neuritis and peri-neuritis consecutive to tubercular meningitis; and, 3, tubercles of the choroid. J. Cohnheim‡ has written on the subject after great labour and research; and von Graefe and Leber,§ and Soelberg Wells,‖ have recorded cases of tubercle in the choroid observed during life.

Professor Knapp¶ describes the dissection of three eyes taken from two women who died from puerperal fever, and in which purulent deposits and inflammation had occurred. He found general stagnation of blood and purulent infiltration in the retina and the uveal tract, and the morbid processes in the eyes seemed completely analogous to those in other parts of the system.

Dr. Emile Adamiuk, of Cazan,** attributes the phenomena of

* 'Gazeta Medica de Lisboa,' 1867.
† 'Archives Générales de Médecine,' 1867.
‡ 'Archiv für Path. Anatomie und Phys.,' xxxix.
§ 'Archiv für Ophthalmologie,' xiv, 1.
‖ 'Med. Times and Gazette,' 1868; and op. cit.
¶ 'Archiv f. Ophth.,' xiii, 1.
** 'Annales d'Oculistique,' 1867.

glaucoma entirely to an impediment to the exit of venous blood from the eye, and thinks this impediment may be due either to thinning with impaired elasticity of the sclerotic, or to a species of hypertrophy of its tissue. He regards the former as the ordinary condition, and as a sequel to insidious inflammatory changes in the choroid. The equatorial region of the sclerotic, around the points of exit of the veins leading from the vortices, would be the part chiefly concerned. The doctrine of Magni, that glaucoma is a result of absolute concentric contraction of the sclerotic, due to diminution in the quantity of the vitreous, still finds advocates in Italy. Becker and Rydel* call attention to the fact that, at Vienna, among persons with simple glaucoma, males considerably preponderate, while females preponderate among persons with inflammatory glaucoma. They ask for observations upon this point in other localities.

Dr. Jacobi† records a case of pigmentation of the retina, probably congenital, in the left eye of a man twenty-five years old. The patient had congenital cataract of the right eye, but perfect vision and complete accommodation with the left. Knapp‡ describes a case of pathological pigmentation of the optic disc. Fano§ relates an instance of a boy, twelve years old, brought to him on account of ciliary blepharitis, and who, when cured of this disorder, complained that the sight of his right eye was imperfect. It was found that with it he could only read No. 17. Ophthalmoscopic examination showed a filament in the vitreous chamber, executing movements of two kinds, and seemingly attached to the optic disc. Fano concluded it to be a filaria, but does not adduce any evidence of the fact except the apparent spontaneity of its movements. May it not have been the remains of the hyaloid artery, and its movements due to the parts around it?

The subject of exophthalmic goitre, or, as he calls it, exophthalmic struma, has been fully treated by Virchow,‖ and MM. Fournier and Ollivier¶ describe the case of a woman suffering from the disease, and whose life was rapidly destroyed by gangrene. Her original symptoms are described as having been very severe, and, when she had been a few days in hospital, she was suddenly attacked by gangrene of the left leg, thigh, and arm. She speedily died, and a most careful autopsy failed to throw any light upon the causes of her malady. In particular, the sympathetic was subjected to a rigorous examination, both with the eye and with the microscope, and it appeared to be in all respects perfectly healthy.

Dr. Xavier Galezowski** has called attention to the phenomena of normal and abnormal colour sensations. He first discusses the various hypotheses of authors with regard to the seat and the nature of colour sensation, and then advances his own. According to this, and upon experimental evidence that the power of distinguishing colours diminishes progressively towards the periphery of the retina, he places the function entirely in the cones, as distinguished from the rods, of the

* 'Bericht über die Augenklinik der Wiener Universität,' 1867.
† 'Arch. f. Ophth.,' xiv, 1.
‡ Ibid.
§ 'Union Médicale,' 1868.
‖ 'Die Krankhaften Geschwülste,' iii.
¶ 'Union Médicale,' 1868.
** 'Annales d'Oculistique,' 1868.

bacillary layer. The luminous waves of white light differ from those of coloured light only in the speed of their vibrations and in their refrangibility. Hence, an organ that is capable of being impressed by such differences of speed, and of perceiving such differences of refrangibility, will convey a more or less exact notion of colour. Such conditions are presented by the cones, which are composed of highly refractive substance, of which the apices are turned towards the centre of the eyeball,* and which are traversed, from base to apex, by a central filament that passes into the granular layer. A pencil of rays, falling on the surface of a cone, near its apex, must necessarily, in traversing the cone, undergo decomposition, according to the laws of light, and must produce at the base concentric circles of the solar spectrum—that is, circles of red, orange, yellow, green, blue, indigo, and violet. The seven circles of the base remain, therefore, constantly sensible of and impressionable by these seven colours, so that, if a pencil of monochromatic light (say of blue light) reaches a cone, it falls wholly upon the circle adapted to receive blue rays, and the other circles remain unimpressed. Each simple colour passes through the cone without decomposition, and goes to its own place. Every compound colour is decomposed, and its elements are distributed. The author suggests that congenital colour-blindness, or incapacity to distinguish certain colours, may be due to imperfect development of the bases of the cones, and also that the state of the colour sensation may afford a test of the character and seat of retinal changes in disease. Disease affecting the region of the macula and the external layers of the retina will destroy the sense of colour wholly or partially, while disease affecting lateral regions or the internal layers (such as in albuminuria retinitis) will leave the sense of colour intact.

In a subsequently published work,† of which the above paper forms an introductory portion, the author proceeds to inquire what are the affections of the eye in which the cones are primarily implicated ; or, in other words, to what morbid changes may any given alteration of colour-sensibility be traced? He illustrates the importance of the inquiry by mentioning the several conditions in which the ophthalmoscopic signs, aided by the other subjective symptoms, are insufficient for the formation of an exact diagnosis. Amongst these are the commencement of nerve atrophy, the amblyopia potatorum, and some forms of syphilitic disease; and M. Galezowski believes that the state of the colour-sensibility will in these be of great importance. He arrives at the following conclusions:

In retinal apoplexies the chromatic faculty is only altered when the

* Without entering upon certain optical difficulties that suggest themselves to my mind, and, at the same time, without wishing to deny that the seat of the function of colour perception may be in the cones, there seems to be a difficulty in the way of the implicit acceptance of the author's hypothesis. That difficulty arises from the fact that the position of the cones in the retina is the exact reverse of what he states it to be. Their bases are turned towards the centre of the eyeball, and their apices towards the choroid.—R. B. C.

† 'Du diagnostic des Maladies des Yeux par la Chromatoscopie retinienne.' Paris, 1868.

patches are very large, or when they affect the central parts of the retina.

In the retinitis of albuminuria or of diabetes there will be no colour-blindness until the disease has reached an advanced stage, so as to involve the external layers of the retina and the macula lutea.

In syphilitic retinitis or neuritis, with or without choroiditis, the general impairment of sight is attended by loss of perception of green, and sometimes of red.

In choroidal atrophy disturbance of chromatic function does not exist unless the layer contiguous to the retina, in the region of the macula, be disorganized.

In atrophy of the nerve the chromatic function suffers from the outset, especially with regard to red and green.

The same occurs in amblyopia potatorum, with the difference that in the former affection the defect is permanent, while in the latter it varies from day to day, and even from hour to hour.

M. Galezowski has added to his book a chromatic scale and test types, founded on the scale of M. Chevreul, and affording the means of testing the colour functions with exactness.

Prof. Quaglino* describes the case of a Turin banker, who had an attack of apoplexy in his 54th year. After some days he recovered consciousness, but was completely blind and paralysed on the left side. The hemiplegia disappeared gradually, and the sight was restored so far that, when seen by the author a year after the attack, he could read the smallest characters, and, to use his own words, could see the sparrows on the tops of the trees. His vision was, however, very imperfect for all objects situated on his left, the images of which would fall on the right side of either retina, and he had totally lost all perception of colour. All faces appeared to him pale and blanched, and he could distinguish nothing but white and black. He had also entirely lost the power of recalling the appearances of things or people by any effort of the mind.

(*d*) *Ophthalmoscopy.—Refraction and Accommodation.*

Dr. Giraud-Teulon† has applied Mr. Laurence's idea of a meniscus, to be at once the reflector and the condensing lens of an ophthalmoscope, to the construction of a fixed instrument that has many advantages of cheapness and simplicity. The meniscus is mounted at the end of a tube nearest to the patient, and its inverted image formed within the tube may be regarded either with the naked eye or with the aid of the common binocular ophthalmoscope. Attempts to magnify the image have been unsuccessful, from its possessing depth as well as superficies, so that the portions out of focus obscure the rest.

Dr. Gustav Reyher‡ recommends diffuse daylight for ophthalmoscopic examination. Zehender§ points out the danger of accidentally using

* 'Giornale d'Oftalmologia Italiano,' 1867.
† 'Annales d'Oculistique,' 1867; 'Ophthalmic Review,' iii, p. 247.
‡ 'Centralblatt. f. d. Med. Wissensch.,' 1858.
§ 'Klin. Monatsbl.,' 1868.

sunlight, and of burning the retina. Czerny* describes some experiments on the eyes of animals which show that Zehender's caution is not uncalled for.

Javal and Nagle† submitted to the Paris Congress a proposal for the general use of the metrical scale and for a series of equal intervals for the focal lengths of test lenses. Burow‡ has also written upon the question. It was referred at Paris to a committee, and their report is not yet published.

Dr. Cohn§ has suggested the use of spectacles made of mica to preserve the eyes from injury in various trades and occupations. They may be coloured blue for stokers, firemen, and the like; and are very light and very cheap.

The most important contribution to this branch of ophthalmology has been Dr. Cohn's researches into the state of refraction of the eyes of schoolchildren and students, detailed in his treatise.‖ He has made a very careful and elaborate examination of the eyes of 10,060 schoolchildren, with the view, not only of obtaining statistics of the disorders of the eyes that are most commonly met with in schools, but also in order to study their causes and to seek means of diminishing their frequency. After some introductory matter, addressed to readers who have no special knowledge of ophthalmology, and intended to make the book intelligible to school managers and others, the author proceeds to give an account of his investigations and results. He furnished the teachers with a scale of test types, to be placed before all the scholars at a certain distance. Those whose acuteness of vision, thus determined, fell below the normal standard, were set apart for further examination, and the state of refraction of their eyes was ascertained by means of the ophthalmoscope. The statements of the children were not trusted, and only objective evidence was received. Thirty-three schools were visited; 5 rural, in the canton of Reichenbach, in Silesia, containing 1486 pupils; and 28 urban, in Breslau, containing 8574 pupils. Among the latter schools were 20 primary (elementary), 2 middle schools, 2 upper schools for girls, 2 normal, and 2 gymnasia. From the 10,060 pupils, 2200 were set aside as having defective vision; and of these, 1730, or 17·1 per cent. of the whole, were found to be ametropic. It seemed that the number of ametropes increased with the labour of study; for in the several categories of schools already mentioned the proportion was as follows, in the order in which they were given:—5·2 per cent., 14·7, 19·2, 21·9, 24·1, and 31·7. In the town there were four times as many as in the country.

The proportion between the number of ametropes and that of emmetropes is shown in the following table:

Emmetropes	8,330	or 83	per cent.
Ametropes	1,334	„ 13	„
Other diseases of the eye	396	„ 4	„
Total	10,060	100	„

* 'Sitzungsbericht der k. Acad. d. Wissensch. zu Wien,' Oct., 1867.
† 'Compte Rendu;' 'Klin. Monatsbl.,' 1868.
‡ 'Klin. Monatsbl.,' 1868. § Ibid.
‖ 'Untersuchungen der Augen von 10,060 Schulkindern,' Leipzig, 1867.

Hence, among children at school, there are three times as many with disorders of refraction as with other affections of the eye.

Among the 1334 ametropes there were—

1004 myopes.
10 myopes whose parents also were myopic.
58 myopes whose myopia appeared subsequently to other diseases of the eyes.
81 hypermetropes.
156 hypermetropes with convergent strabismus.
23 astigmatics.

Hence myopia is twelve times as frequent as simple hypermetropia, and six or seven times as frequent as hypermetropia with convergent strabismus.

The third chapter, which occupies about two thirds of the book, is devoted to myopia. We have seen that the author found 1004 myopes, in which number are not included cases of hereditary or consecutive myopia, nor cases in which the myopia was less than $\frac{1}{30}$. M. Cohn states the following propositions:

(1) There is no school without myopes.

(2) Their number differs greatly in the several categories of schools.

(3) They are relatively very few (1·4 per cent.) in village schools.

(4) They are eight times as frequent (11·4 per cent.) in town schools.

(5) In the primary schools of towns they are four or five times as numerous (6·7 per cent.) as in the rural schools.

(6) The upper girls' schools present more cases (7·7 per cent.) than the primary schools.

(7) In town schools the proportion of myopes increases with the grade of the school (primary, 6·7; middle, 10·3; normal, 19·7; and gymnasia, 26·2 per cent.).

(8) In village schools, as in those of towns, the proportion of myopes increases with the grade of school, but less rapidly, and not more than 2·4 per cent.; the lowest proportion being 0·8, and the highest 3·2 per cent.

(9) For a certain number of middle schools, normal schools, and gymnasia, the proportion of myopes differs very little between one school and another.

(10) The difference is, however, more considerable in girls' schools, and still more in primary schools, where the proportion of myopic pupils varied from 1·8 to 15·1 per cent.

The author then states the proportions obtained from the 166 classes in the 33 schools.

There were but 11 classes that contained no myopes, and these were all low in their respective schools. By adding separately the myopes of the third, the second, and the first classes, in rural schools, the proportions obtained were—1·4, 1·5, and 2·6 per cent. By doing the same for the primary schools of towns, the series became 3·5, 9·8, and 9·7 per cent. For the normal schools, 9·6, 16·7, 19·2, 25·1, 26·4, and 44 per cent. Lastly, for the gymnasia, 12·5, 18·2, 23·7, 31·, 55·8 per cent. Thus, it appears that, in the gymnasia, more than half the pupils of the upper class are myopic; and that in every school, no matter of what

description, the upper classes contain more myopes than the lower. M. Cohn shows also that, in the 33 schools, the proportion of myopic boys is twice as great as that of girls.

The numbers are then examined with regard to the ages of the children and the year of their commencing school. The author finds that the frequency of myopia regularly increases over biennial periods, in rural schools as in those of towns. He found no myopes among the pupils who had not yet attended school for a quarter. Among pupils of the same year, in different schools, the proportion of myopes varies according to the character of the school. Thus, in rural schools the pupils of the fifth and six years furnish a mean of 1·6, in the primary schools of towns of 8·2, in the middle schools of 11·9, and in the normal schools and the gymnasia of 14·5 per cent.

The age of the children shows a progression in the number of myopes analogous to that shown by the years of study. The number increases from the seventh to the twentieth year (it is at seven years that most of the children enter school). If we add together the numbers that correspond to the first four years, to the second four, and to the last six, we obtain the series of 4·5, 9·6, and 28·6 per cent., figures which show the frequency of myopia between seven years and ten, between eleven and fourteen, and between fifteen and twenty.

The author next considers the degree of the myopia in the several categories of schools and classes, according to the sex and age of the pupils, and according to the time they have been at school. He arranges the myopes under six divisions:

The 1st, M. $\frac{1}{33}$ to M. $\frac{1}{24}$ contains	466
2nd, M. $\frac{1}{23}$,, M. $\frac{1}{16}$,, ...	303
3rd, M. $\frac{1}{15}$,, M. $\frac{1}{12}$,, ...	150
4th, M. $\frac{1}{11}$,, M. $\frac{1}{8}$,, ...	76
5th, M. $\frac{1}{7}$	6
6th, M. $\frac{1}{6}$	3
Total	1004

In the rural schools more than three fourths of the myopes belong to the first division, and the rest to the second. In only one case did the myopia exceed $\frac{1}{16}$.

In the primary and in the girls' schools more than half the myopia ranged between $\frac{1}{33}$ and $\frac{1}{20}$, but as high a grade as $\frac{1}{8}$ was attained in some cases. In the normal schools and gymnasia the last five divisions, from $\frac{1}{23}$ to $\frac{1}{6}$, much exceeded the first. There appeared to be an increase from each class to that above it. M. $\frac{1}{7}$ was not found below the third class of a normal school, nor M. $\frac{1}{6}$ below the first class of a gymnasium. The degree of myopia was generally greater among boys than among girls, and appeared to increase with the age and with the number of years of study.

The author then calculates the mean degree of myopia for the pupils of the same class, of the same school, and of the same category of school. In the five village schools the mean degree was $\frac{1}{24}$; in the twenty primary schools, $\frac{1}{22\cdot7}$; in the two girls' schools, $\frac{1}{23\cdot5}$; in the two middle schools, $\frac{1}{21\cdot9}$; in the two normal schools, $\frac{1}{19\cdot6}$; in the two gymnasia,

$\frac{1}{18}$ $\frac{1}{7}$; and among the whole number of cases, $\frac{1}{21\cdot8}$. Thus, the mean degree of myopia steadily increases from the rural schools to the gymnasia. Among the boys the mean was $\frac{1}{21\cdot6}$; among the girls it was $\frac{1}{21\cdot4}$; not a great difference. Among children between six and ten the mean degree was $\frac{1}{24}$; between eleven and fifteen, $\frac{1}{21\cdot2}$; and between sixteen and twenty, $\frac{1}{18\cdot3}$.

Staphyloma posterior was found in 200 cases out of the 1004. The following table shows the proportion between the degree of the myopia and the frequency of staphyloma.

Among 100 myopes from	$\frac{1}{35}$	to $\frac{1}{24}$	. .	3 staph.
" "	$\frac{1}{25}$	" $\frac{1}{1}$	. .	17 "
" "	$\frac{1}{15}$	" $\frac{1}{12}$	. .	48 "
" "	$\frac{1}{11}$	" $\frac{1}{8}$	. .	65 "
" "	$\frac{1}{7}$		. .	71 "
" "	$\frac{1}{6}$		. .	100 "

Thus, the frequency of staphyloma increased directly as the degree of the myopia. With M. $\frac{1}{21\cdot6}$ staphyloma is the exception, and with M. $\frac{1}{7}$ it is the rule. There was no case of M. $\frac{1}{6}$ without staphyloma.

It has been stated that there were 28 cases of hereditary myopia; and it was observed that the affection had usually been transmitted from father to daughter, and from mother to son. As inheritance evidently plays but a subordinate part in the production of myopia among scholars, M. Cohn examines the conditions which promote the commencement and progress of the disorder. They are the defective construction of the school-fittings, the insufficient lighting of the class rooms, and the use of spectacles of too high or too low power.

M. Cohn has examined the school-fittings of 166 classes, with regard to the height, inclination, and size of the desks, the height of the banquette, and its distance, vertical and horizontal, from the desk, the height and distance of the bench, &c. He compared these dimensions with the average height of the pupils of the class, and found that there was never a proper proportion between them. Hence the pupils were forced to flex the head acutely upon the neck, so as to hinder the circulation in the efferent vessels of the eye, and to produce blood stasis in the choroid. It follows also that they were compelled to regard their work from too near a point (three or four inches), so as to make excessive efforts of accommodation, attended by injurious pressure upon the eyeballs. These two consequences of a forced and faulty attitude were sufficient to produce elongation of the eyeball, and with this myopia. M. Cohn points out as the most important defects—(1) The too great distance, both vertical and horizontal, between the desk and the banquette; (2) the too great height of the banquette; (3) the insufficient inclination of the desks. And he gives designs of the model furniture introduced, under his advice, into the new schools at Breslau.

Proceeding to consider the effect of bad lighting, the author finds that the proportion of myopes is always larger in direct ratio as a school is situated in a narrow street, as the opposite houses are lofty, and as the rooms are low. Thus, among the twenty primary schools at Breslau, some are situated in the wide streets of the new quarter,

others in the dark and narrow streets of the old town. In the former the proportion of myopes was from 1·8 to 6·6 per cent.; in the latter, from 7·4 to 15·1. The author insists, therefore, upon the importance of a good site. He determines the proper size and number of the windows with reference to the number of pupils that the room is intended to contain. A room for twenty pupils should have a window eight or nine feet high by five feet wide.

While spectacles which completely correct the myopia are not only useful as aids to the visual function, but may even check the progress of the affection, so nothing is more injurious than the use of spectacles not suited to the degree of the myopia. The choice of glasses is therefore a matter of great importance, and requires to be judiciously controlled. M. Cohn found that among 107 pupils who wore spectacles, 99 had chosen them for themselves, and only the remaining 8 had sought medical advice upon the point. Of the spectacles, 26 neutralized the myopia of the wearer, 41 were too weak, and 40 were too strong.

Such, then, are the causes to which the author attributes the excessive prevalence of myopia among scholars. They deserve the attention of readers on account of the gravity of an affection that, contrary to the prevailing belief, tends to increase rather than to decrease, and that may occasion loss of sight by staphyloma and its attendant atrophy.

M. Cohn found 239 hypermetropes, of whom 152 were boys, and 87 girls. The degree varied from $\frac{1}{3}$ to $\frac{1}{60}$. In the village schools the mean degree was $\frac{1}{34}$; in the primary schools of the town, $\frac{1}{32}$; in the middle schools, $\frac{1}{37}$; in the upper girls' schools, $\frac{1}{26}$; in the normal schools, $\frac{1}{28}$; and in the gymnasia, $\frac{1}{24}$.

The age and length of pupilage exercise no influence upon the frequency of hypermetropia, but they do influence the degree. It was only among the upper classes that M. Cohn found the higher degrees. We may conceive that sustained efforts would fatigue the muscle of accommodation, and tend to render manifest the latent portion of the defect. Nine hypermetropes were wearing convex spectacles.

It is well known that hypermetropia is often combined with convergent squint. M. Cohn found 158 instances of the combination, that is, about 60 per cent. of the hypermetropes, and 1·5 per cent. of all the pupils. The squint affected the right eye in 104, the left in 31 cases. It was periodic in 44, concomitant in 114. The medium degrees of hypermetropia were most frequently associated with squint. They were—

In 100 H.	$\frac{1}{1}$	to H.	$\frac{1}{40}$	38·4 strab. conv.
,,	$\frac{1}{39}$	,,	$\frac{1}{20}$	75 ,,
,,	$\frac{1}{19}$	,,	$\frac{1}{8}$	53·1 ,,

Twenty-three children were astigmatic, or about 3·1 per cent. of the ametropes. The cases were—

Myopic astigmatism	7
Hypermetropic	8
Mixed	4
Irregular	4
Total	23

In this number the author does not include cases of astigmatism due to any lesion of the cornea. One child alone was wearing plano-cylindrical glasses.

The last chapter of M. Cohn's treatise describes the various ocular affections found in 396 of the children, or 4 per cent. They were twice as numerous in the town schools as in those of the villages. The most important of them are changes in the cornea and strabismus.

Opacities of the cornea were very common among the pupils of the primary schools, especially of those in the old quarter of Breslau, and attended by the children of the most indigent. They were much less common in the country.

M. Cohn found 64 cases of convergent strabismus without hypermetropia. In 19 children the deviation was consequent upon some other affection of the eye. But the other 45 presented no anatomical lesion, and no fault of refraction that could be regarded as a cause of strabismus; 35 of the cases were periodic, and 10 were concomitant.

In the schools in which strabismus, without appreciable organic cause, was, in M. Cohn's language, endemic, he found the children in the habit of amusing themselves by looking fixedly at the index finger, held very near the nose, so as to produce extreme convergence of the visual lines. He believes this practice to be the cause of the strabismus, and advises that it should be forbidden.

Among 100 cases of convergent strabismus, 71 were complicated by hypermetropia; 8 by other ocular affections; 21 were free from complications. These numbers show the close relations between hypermetropia and squint, and fully confirm the statements of Donders.

In conclusion the author advises—

1. That school-fittings should be made with due reference to the height of the pupils.

2. That class-rooms should be sufficiently lighted.

3. That the selection of spectacles should be entrusted to medical practitioners.

4. That teachers should forbid the children to squint.

5. That school-managers should learn the elements of ocular hygiene, so as to understand what conditions would act injuriously upon the vision of the scholars.

Since the publication of the treatise, of which the foregoing is an abstract, the author has examined the eyes of 410 out of 964 students of the Breslau University, and has recorded his results.* He found 134 emmetropes, 244 myopes, and 32 with other conditions; so that less than one third of the whole number were normal sighted, and nearly two thirds were short sighted. The mean grade of myopia was $\frac{1}{14}$, and the higher degrees were usually in the children of myopic parents. The mean grade was distinctly higher among the students who occupied the worst lighted rooms. Of the 224 myopes, 174 used concave glasses, and of these 55 neutralized, 85 corrected, and 34 over-neutralized, the myopia. The author concludes by strongly insisting upon the necessity for attention to the hygiene of vision in all educational establishments.

* 'Berl. Klin. Wochenschr.,' 1867.

The following additional references may be given:

Orbit and Eyeball.—H. Wilson, on affections of the eye in cerebro-spinal meningitis ('Dub. Qu. Journ.,' May, 1867). Hildige, case of tumour of the eyeball ('Dub. Qu. Jour.,' 1868). Hirschberg, cases of tumour of eyeball and orbit ('Klin. Mon.,' 1868, p. 153). Betz, case of cancerous tumour entering the orbit and nasal fossæ; enucleation; ligature of carotid, autopsy ('Memorabilien,' xiii, 2). Sichel, Encephaloid and melanotic tumour ('Gaz. Méd. de Paris,' 1868, No. 34). Borelli, case of exophthalmia cured by internal revulsives ('Giorn. d' Oft. Ital.,' 1867, p. 65). Gradenigo, case of extirpation of a large orbital fibroma, with preservation of vision ('Giorn. d' Oft. Ital.,' 1867, p. 356). Nagel, on phthisis bulbi ('Arch. f. Ophth.,' xiii, 2, p. 407). Pelechin, on Schlemm's canal ('Arch. f. Ophth.,' xiii, 2, p. 423). Schiess-Gemuseus, contribution to the pathological anatomy of the eye and orbit ('Arch. f. Ophth.,' xiv, 1, p. 73). Von Graefe, on intra-ocular tumours ('Arch. f. Ophth.,' xiv, 2, p. 103). Manz, case of malformation of the eye ('Arch. f. Ophth.,' xiv, 2, p. 145). Cohn, on exophthalmometry ('Compte-rendu de Congrès,' p. 21). Von Graefe, on tenotomy of the levator palpebræ in exophthalmic goitre ('Compte-rendu de Congrès,' p. 58). Borelli, on a rare case of intra-orbital tumour, with hypertrophy of the eyelids ('Compte-rendu du Congrès,' p. 149). Delgado, exophthalmus from intra-cranial tumour (ib., p. 153). Lawson, case of rapid inflammatory destruction of the eyeball ('Lancet,' 1868, i, p. 500). Wilde, on epidemic of ophthalmic disease ('Med. Times and Gaz.,' 1868, i, p. 115).

Conjunctiva.—Champouillon, on Algerian ophthalmia ('Gaz. Méd. de l'Algérie,' 1867, No. 6). Dr. Lebrun, singular growth on the ocular conjunctiva ('Ann. d'Oc.,' lviii, p. 257). Prof. Alfred Graefe, on conjunctiva blennorrhœa ('Berl. Klin. Wochenschr.,' Feb. 1868). Sichel, pemphigus of the conjunctiva ('Klin. Mon.,' 1868, p. 232). Gosselin, on the treatment of purulent ophthalmia by alcoholic lotions ('Gaz. des Hôp.,' Jan. 1867). Fano, on the treatment of purulent ophthalmia by large doses of tartar emetic, and by mercurial ointment around the orbit ('Gaz. des Hôp.,' 1867). Rosmini, on the treatment of purulent ophthalmia ('Giorn. d' Oft. Ital.,' 1868, p. 22). Forget, on the treatment of ophthalmia by closure of the eyelids ('Bull. de Thérap.,' 1867).

Lachrymal Apparatus.—Sichel, remarks on bony swellings of the lachrymal passages ('France Médicale,' 1868, No. 41, p. 292). B. Ruete, case in which a canula had been worn 46 years in the lachrymal duct ('Klin. Mon.,' 1868, p. 236). J. Z. Laurence, on removal of the lachrymal gland ('Compte-rendu du Congrès,' p. 35; 'Ophthalmic Rev.,' iii, p. 138; ib., p. 361).

Cornea.—Engelmann, on the cornea ('Ueber die Hornhaut des Auges,' Leipzig, 1867). J. Cohnheim, on the termination of the sensitive nerves in the cornea ('Virchow's Archiv,' xxxviii). Ph. Steffan, on congenital anomalies of the cornea ('Klin. Mon.,' 1867, p. 209). Czerny, on the presence of spinated cells (*Stachelzellen*) in staphyloma corneæ ('Ber. über die Wien, Augenkl.' 1867, p. 190). Carl Fried. Müller, microscopic researches upon the cornea ('Virchow's Archiv,' xli, p. 110). Fried. A. Hoffman, on suppuration in the cornea ('Virchow's Archiv,' xlii, p. 204). Castorani, on the treatment of corneal opacities ('Gaz. de Paris,' 1867). Heymann, on linear corneal opacities ('Ophthal. aus dem Jahre, 1867,' p. 16). Hirschberg, on ulceration of the cornea in infantile encephalitis ('Berl. Klin. Wochenschr.,' 1868, No. 31). Borelli, on the treatment of staphyloma by ligature ('Giorn. d. Oft. Ital.,' 1867, p. 85). Quadri, case of irido-encleisis in staphyloma ('Giorn. d' Oft. Ital.,' 1867, p. 258). Classen, on corneal inflammations ('Arch. f. Ophth.,' xiii, 2, p. 453).

Iris.—Schur, influence of light, heat, and other agents, upon the size of the pupil ('Zeitsch. f. rat. Med.,' xxxi, 3). Dobrowolsky, cases of irido-choroiditis ('Klin. Mon.,' 1868, p. 239). Merkel, on the anatomy of the iris ('Zeitschr. f. rat. Med.,' 1868, p. 136). G. Calderini, on the contact of the iris with the crystalline lens in the human eye ('Giorn. d' Oft. Ital.,' 1867, p. 333). Haase, on the anatomy of the ligamentum pectinatum of the iris ('Arch. f. Ophth.,' xiv, 1, p. 47). Blessig, on a form of irido-choroiditis complicating the recurrent fever of Russia ('Compte-rendu,' p. 114).

Lens.—R. Liebreich, the diagnosis of cataract ('Nouveau Dict. de Méd. et de Chir. Prat.,' vi, p. 497, Paris). Heymann, on linear extraction ('Klin. Mon.,' 1868). Höring, on linear extraction (ib.). Ezra Dyer, rupture of the lens and capsule in death by hanging ('Trans. Amer. Ophth. Soc.,' 1867, p. 13). Manz, cilia in the posterior chamber ('Klin. Mon.,' 1868, p. 178). Monoyer, cataract extraction in a case of spon-

taneous luxation, with structural changes of the iris and vitreous ('Gaz. Méd. de Strasbourg,' 1867, p. 171). Paulsen, contribution to the statistics of linear extraction. (Inaug. Diss., Kiel, 1868). Paoli, on the methods of operation to be preferred in different cases of cataract (Turin, 1867). Adolph Weber, normal lens extraction through a linear section ('Arch. f. Ophth.,' xiii, 1, p. 187). Zernoff, on the microscopic structure of the lens in man and in the vertebrata ('Arch. f. Ophth.,' xiii, 2, p. 521). Rothmund, cataract in connection with a peculiar degeneration of the skin ('Arch. f. Ophth.,' xiv, 1, p. 159). Jacobson, on von Graefe's most recent mode of cataract extraction ('Arch. f. Ophth.,' xiv, 2, p. 247). Becker, on the results obtained in Arlt's clinique by Graefe's method of extraction ('Compte-rendu de Congrès,' pp. 72 and 93). Faye, on the possibility of arresting cataract ('Compte-rendu de Congrès,' p. 141). Ansiaux, unusual case of traumatic cataract ('Compte-rendu de Congrès,' p. 178). Macnamara, on linear extraction ('Ophth. Rev.,' iii, p. 239). T. Windsor, a new operation for cataract ('Ophth. Rev.,' iii, p. 251).

Vitreous.—Iwanoff, cases of detachment of the hyaloid membrane from the retina ('Klin. Mon.,' 1868). Smith, on the structure of the vitreous humour ('Lancet,' 1868, ii, pp. 376, 725). C. Bader, vitreous substance and vitreous chamber (op. cit., p. 320).

Retina and Optic Nerve.—Ph. Steffan, nutrition of the retina ('Ann. d'O,' lvii, p. 18). Houdin, examination of the retina by phosphenes ('Acad. des Sciences,' 1868, March). J. W. Hulke, anatomy of the fovea centralis of the human eye ('Phil. Trans.,' 1867). Haase, pigmentary retinitis, with hyperæsthesia ('Klin. Mon.,' 1867, p. 228). Schirmer, embolia of the central artery of the retina ('Klin. Mon.,' 1868, p. 39). Alexander, retinal hyperæsthesia ('Klin. Mon.,' 1868, p. 43). Wecker, effusion of blood in the optic nerve, and pathological pigmentation of the disk ('Klin. Mon.,' 1868, p. 204). Mauriziano, observations on the retinal diseases in Borelli's clinique ('Giorn. d' Oft. Ital.,' 1867, p. 26). Ponti Floriano, glioma of the retina ('Giorn. d' Oft. Ital.,' 1868, p. 1). Hirschberg, anatomical examinations of glioma retinæ ('Arch. f. Ophth.,' xiv, 2, p. 30). Leber, on atrophy of the optic nerves ('Arch. f. Ophth.,' xiv, 2, p. 164). On inflammation of the optic nerves (ib., p. 333). Knapp, on glioma ('Compte-rendu de Congrès,' p. 25). Von Graefe, on division of the optic nerve in some painful affections of the eye ('Compte-rendu de Congrès,' p. 59). Dr. G. Harley, auto-clinical remarks on injury to the retina by overwork with the microscope ('Lancet,' 1868, i, p. 158). J. Hughlings Jackson, on latency of optic neuritis in cerebral disease ('Med. Times and Gaz.,' 1868, i, p. 143). Case of severe brain disease, with double optic neuritis (ib., p. 392). T. Clifford Allbutt, the state of the optic nerves and retinæ in the insane ('Med. Times and Gaz.,' 1868, i, p. 328). On optic neuritis (ib., p. 495, *et seq.*).

Choroid.—Demarquay, case of sarcoma of the choroid ('Ann. d'Oc.,' p. 126). Talko, case of rupture of the choroid ('Klin. Mon.,' 1868, p. 269). Mauriziano, observations on the choroidal diseases in Borelli's clinique ('Giorg. d' Oft. Ital.,' 1867, p. 90). Haase, on the anatomy of the choroid ('Arch. f. Ophth.,' xvi, p. 57). Leber, case of sarcoma of the choroid ('Arch. f. Ophth.,' xiv, 2, p. 221).

Glaucoma.—Mazzei, contribution to the study of glaucoma ('La Rivista Clinica,' 1867). Heymann, on glaucoma in eyes from which the lens has been removed ('Klin. Mon.,' 1867, p. 147). Korn, unusual course of subacute glaucoma ('Klin. Mon.,' 1867, p. 224). Belloc, on glaucoma ('De l'Ophthalmie Glaucomateuse,' &c., Paris, 1867), Stellwag von Carion, on intra-ocular pressure ('Der intra oculare Druck,' &c., Wien. 1868). T. Windsor, on glaucoma in congenital deficiency of the iris ('Ophth. Rev.,' iii, p. 146).

Amblyopia and Amaurosis.—Prof. Alfred Graefe, on simulated monocular amaurosis ('Klin. Mon.,' 1867, p. 53). Hjort, case of hemiopia; autopsy ('Klin. Mon.,' 1867, p. 166). Joao de Lacerda, case of amblyopia cured by strychnia ('Gazeta Medica de Lisboa,' 1867, p. 291). Zagórski, case of hemiopia after apoplexy, with complete recovery 'Klin. Mon.,' 1867, p. 322), Jacobs, case of hæmatemesis and spinal neuralgia, with complete amaurosis ('Berl. Klin. Wochensc.,' Jan. 1868). Ebert, on transitory blindness in typhus and scarlet fever ('Berl. Klin. Wochenschr.,' Jan. 1868). Fargues, on the anatomical lesions in cases formerly called amaurotic ('Giorn. d' Oft. Ital.,' 1868, p. 43). De Welz, on the detection of simulated monocular amaurosis ('Compte-rendu de Congrès,' p. 123). Macnamara, temporary loss of sight in paralysis ('Med. Times and Gaz.,' 1868, i, p. 468).

Vision.—Serre (d'Uzès), experimental researches on binocular vision ('Gaz. des Hôp.,' 1867, No. 72, p. 286). Giné, on the cerebral organ by which light is perceived ('El Compilador Médico de Barcellona,' 1867, Nos. 47 and 48). Hüfner, endeavour to explain the partial colour-blindness produced by santonine in accordance with Young's theory ('Arch. f. Ophth.,' xiii, 2, p. 309). Mandelstamm, contribution to the physiology of colour ('Arch. f. Ophth.,' xiii, 2, p. 399). Goubert, on normal and abnormal colour-perception ('De la Perceptivité normale et surtout anormale de l'Œil pour les Couleurs,' &c., Paris, 1867). Hering, binocular vision ('Die Lehre von Binocularen Sehen,' Leipzig, 1868). Classen, physiological optics ('Gesammelte Abhandlungen über Physiologische Optik.,' Berlin, 1868). Helmholtz, on the production of relief in binocular vision ('Compte-rendu de Congrès,' p. 53). Wecker, a new instrument for measuring the field of vision ('Compte-rendu de Congrès,' p. 64). Förster, measurements of the field of vision ('Compte-rendu de Congrès,' p. 125).

Refraction and Ophthalmoscopy.—Dr. Giraud-Teulon ('De Œil,' Paris, 1867). Burow, on the law of axial direction where one eye only is furnished with a lens ('Arch. f. Ophth.,' xiii, 2, p. 327). Kaiser, case of anisometropia ('Arch. f. Ophth.,' xiii, 2, p. 353). Von Bezold, dispersion circles on the retina ('Arch. f. Ophth.,' xiv, 2, p. 1). Fano, on spectacles and their use ('Des Lunettes,' &c., Paris, 1867). Scheffler, ocular defects ('Die Theorie der Augenfehler,' &c., Wien, 1868). Chevalier, on the choice of glasses, &c. ('Manuel de l'étudiant oculiste,' &c., Paris, 1868). On medical ophthalmoscopy ('Brit. and For. Med.-Chir. Rev.,' Jan. 1868). Knapp, on the ophthalmoscopic determination of the thickness and position of intra-ocular exudations ('Compte-rendu de Congrès,' p. 165). Giraud-Teulon, instrument for ophthalmoscopic measurement of the optic disk (ib., p. 146).

Muscles.—Galezowski, on diplopia in locomotor ataxy ('Gaz. des Hôp.,' 1867, No. 73, p. 290). Dr. Testelin, on asthenopia ('Dict. Encyclop. des Sci. Med.,' vii, p. 718). Liebreich, modification of "proraphia" or displacement of a muscle forwards ('Klin. Mon.,' 1868). Cuignet, convergent strabismus in connection with corneal opacities ('Gaz. Méd. de l'Algérie,' 1868). Laennec, paralysis of accommodation following diphtheria ('Journ. de Méd. l'Ouest,' 1868, ii). Fano, severe nystagmus; cure ('Un. Méd.,' 1868, p. 398). Schweigger, on squint ('Klin. Mon.,' 1867, p. 1). Zagórski, unusual results of a squint operation in a case of Bright's disease ('Klin. Mon.,' 1867, p. 317). F. E. Schulze, on the human ciliary muscle ('Arch. f. Microsk. Anat.,' iii, p. 477). Dobrowolsky, hyperæsthesia of the ciliary muscle ('Klin. Mon.,' 1868, p. 244). Carreras y Aragò, case of paralysis of the ciliary muscle ('El Compilador Medico de Barcellona,' Feb. 1867). Stilling, case of combined spasm of the ocular muscles ('Arch. f. Ophth.,' xiv, 1, p. 97). Liebreich, cases of squint ('Compte-rendu de Congrès,' p. 104). Little, table of 65 cases of squint ('Ophth. Rev.,' iii, p. 148).

A complete index to the first ten volumes of the 'Archiv für Ophthalmologie' has been compiled by Dr. J. Wurm, and published by Morgenstern, Breslau. It gives references to the subjects, and also to the names of the writers.

REPORT

ON

MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN.

BY

ROBERT BARNES, M.D., F.R.C.P.

I. GYNÆCOLOGY, EMBRACING THE PHYSIOLOGY AND PATHOLOGY OF THE NON-PREGNANT STATE.

Menstruation.

SERRES relates ('Gaz. des Hôp.,' 1867) a case in which, after recovery from ovariotomy, a small fistula remaining from a suture yielded blood at every period. T. Bryant relates a case in which blood issued from the stump of an ovarian pedicle a month after operation.

Louis Mayer, of Berlin, has studied the question of the first appearance of menstruation in different races. The subject was illustrated by many contributions to the International Medical Congress held in Paris in 1867 ('Gaz. des Hôpitaux'). Lagneau collected 15,948 observations from different physicians, showing that menstruation appears between 15 and 16 years in Labrador, North Germany, Warsaw, Strasburg, Lyons, Madeira, and Jamaica; between 16 and 17 in Norway, Copenhagen, Poland; and between 14 and 15 in Manchester, London, Paris, Marseilles, Toulon, Corfu; and before the 13th year in British India. Joulin collected 16,517 cases; 10,080 of these belong to the zone between 33° and 54° north latitude. Menstruation set in at 15 in 1824 cases, at 16 in 15,162, and at 14 in 1114. In the hot zone, between 33° north and the equator, 1724 cases are collected, in 407 menstruation appeared at 12; in 381 at 13. Out of 4713 cases in the frigid zone it appeared at 15 in 872, at 16 in 874.

H. Vogt ('Norsk Magaz. of Obstetrics,' 1867) discusses the occurrence of menstruation in Norway. Out of 1821 girls, the average first appearance was 16·12 years; Laplanders, 16·7. In 1448 persons the average duration was 3·7 days; for Laplanders, 3·4 days. One Laplander menstruated only once a year. In 391 women 49 was the average age of cessation.

Dr. Horwitz ('St. Petersb. Med. Ztschr.,' 1867) relates a case of premature puberty; menstruation set in at the age of 10, pregnancy at 12; delivery of live child, milk abundant.

The Decidua Menstrualis.

Dr. Hausmann gives an historical review of the researches hitherto made on this subject. He says he has never observed an entire cast of the uterine cavity, the membrane having always been expelled in three or four pieces. The membranes were from 1 to 4 centim. long, of variable width, and usually thinner at the margin of transition from the anterior to the posterior wall of the cavity, at times only hanging together by a few shreds. The inner wall showed a smooth surface, and upon more minute examination several crossing forks, already described by Follin, enclosing, when recent, in their midst deeply red areas. These last, as well as partially translucent spots, depend upon an unequal thickness of the detached mucous membrane, as may be easily seen by sections made through these spots. Within these larger crossings the inner surface shows a number of punctate small openings, which are the expanded mouths of the uterine glands, an appearance which made Hunter call the membrane the *membrana cribrosa*. The outer surface was rough from hanging shreds. The microscope made manifest the uterine glands accompanied by capillary network; broad rounded cells, mostly having a large nucleus and a nucleolus, which sometimes was elongated and pointed at one or both ends, giving a spindle shape. With these cells were a few free nuclei, and near the outer surface was an abundant, loose, fibrous connective tissue.

As to the origin of this casting of the uterine mucous membrane, Dr. Hausmann contends that they are the result of impregnation. He disputes the statement that the membrane is shed every four weeks; he says the casts commonly occur after intervals longer than ordinary; that they occur only in married women, or in women exposed to sexual intercourse; he calls attention to the fact that women, who before menstruation never had anything of the kind, begin to expel these membranes afterwards.

He concludes that these membranes are abortions of some days or weeks, the mucous membrane of the uterus converted into decidua being expelled after the perishing or escape of the ovum. This occurs preferably at a menstrual epoch, and this may favour the idea that it is a simple menstrual decidua, but often the interval is longer than four weeks. The membrane is expelled commonly within six to twenty-four hours after the beginning of the hæmorrhage, sometimes later, and generally after pains. There are probably various causes of the abortion, but probably the premature destruction of the embryo precedes it. The frequent catarrh of the uterine mucous membrane and chronic metritis associated with this condition are generally the consequence of it. The most essential rule in treatment is the abstinence from sexual relations for several months ('Monatsschr. f. Geburtsk.,' January, 1868).

Anomalies of Structure.

Dr. Woodman describes ('Obst. Trans.,' ix) three cases in which *a third nipple* existed; one was hereditary.

Dr. Livius Fürst contributes a treatise on defective formations of the utero-vaginal canal (1867).

Dr. Matthews Duncan describes cases of vagina duplex and vagina simplex ('Journ. of Anat. and Phys.,' 1867).

Dr. H. M. Tuckwell relates three cases ('Brit. and For. Med.-Chir. Rev.,' 1867) of imperforate hymen. Two recovered after operation. One died, not having been operated upon. The preparation is in the Oxford Pathological Museum. It is a double sac, half formed by the dilated vagina, half by the dilated uterus thinned to the appearance of the bladder; the right Fallopian tube is much distended. Peritonitis was the probable cause of death. See also case by E. Copeman ('Obst. Trans.,' x).

Dr. Gosselin relates ('Gaz. des Hôpitaux,' 1867) a case of absence of vagina, with retention of menstrual blood; an artificial vagina was made, and a large quantity of fluid evacuated. The patient died on the fifth day. A large quantity of chocolate-coloured fluid was found in abdomen, and recent peritonitis. A tube had ruptured, giving exit to fluid into the abdomen. Röcker ('Ztsch. f. Wunda. u. Geburtsk.,' 1867) gives a case of recovery after puncture.

On utero-vaginal atresia and stenosis, by Dr. P. Müller. A case is related, and references are made to others recorded ('Mon. f. Geburtsk.,' 1867).

Dr. Schroter relates ('Berl. Klin. Wochensch.,' 1866) a case of one-sided hæmatometra, with a double genital canal.

D. Gantwort ('Nederl. Tijdsch. v. Geneesk.,' 1867) describes a case of retention through defect of vagina, cured by making an artificial vagina and puncturing the uterus. The uterus was washed out with warm water. See also G. Huet ('Nederl. Tijdsch.,' 1867).

Dr. Eggel gives ('Monatsschr. f. Geb.,' 1868) a case of congenital atresia vaginæ with retention, relieved by puncture.

The operation for hæmatometra is fully discussed by Rose ('Mon. f. Geb.,' 1868); he adds 5 cases observed by himself; in one there was absence of vagina; cure. Prof. E. Martin contributes a case (loc. cit.). O. Passauer ('Berl. Klin. Wochnschr.,' 1867) describes a case of one-sided hæmatometra with double genital canal; cure by puncture.

Peri-uterine Conditions.—Hæmatocele; Pelvic Cellulitis; Pelvic Peritonitis.

Schramm relates a case of hæmatocele diagnosed by Scanzoni ('Wien. Med. Wchbl.,' 1867), who verified the decrease of the tumour by means of the callipers, applying one branch to the summit of the tumour through the abdomen, the other to the base by the vagina.

H. Cooper relates ('Brit. Med. Journ.,' 1867) a fatal case. Section showed pus and coagula in the recto-vaginal pouch; the abdominal ends of the tubes opened into the pouch, and made a communication with the uterus.

H. Bresgen ('Inaugural Dissert.,' Berlin), on hæmatoma uterinum, discusses the subject and relates cases from Martin's Clinique.

J. W. Ogle ('St. George's Reports,' 1867) gives an autopsy where a tumour in the pelvis, formed by blood between the layers of the broad ligament, was found; it was the result of perforation of the ileum. The patient had suffered from constipation and stercoraceous vomiting.

Gueneau de Mussy ('Arch. Gén. de Méd.,' 1867) gives an essay on phlegmon of the broad ligaments after labour.

Horwitz describes ('Petersb. Med. Zeitschr.,' 1867) peri-uterine abscesses in the non-puerperal state. They arise, he says, mostly from ovarian disease. In one case he found apoplexy of the left ovary; cases have occurred from sounding the uterus.

Vaginismus is discussed by Scanzoni ('Wien. Med. Wchbl.,' 1867); by Revillout ('Gaz. des Hôp.,' 1867). Scanzoni does not find the cutting operation of Sims necessary.

A case of *coccyodynia* is related by Dr. G. Kidd ('Dub. Journ. of Med. Sci.,' 1867). He cites the accounts given by Simpson, West, and Scanzoni. A young lady in her first labour had a very long unyielding perinæum. On getting about she had great pain in the coccyx, especially in sitting down and rising up. Dr. Kidd introduced a narrow tenotome at the point of the coccyx, close to the right side, and above the part found tender on pressure. He then cut from behind forwards, keeping close to the bone, dividing all the tissues on that side. He then carried the knife round the apex, cutting all the fibres attached there, then passing up the left side divided the tissues in the same way. Only a few drops of blood escaped. Complete relief was gained.

Uterine Tumours.

Dr. Guéniot discusses the use of acupuncture as a means of diagnosis of uterine tumours. It gives indications as to sensibility, resistance, hardness of tissue, and the greater or less vascular development. In a woman, aged 56, a second tumour was discovered immediately after the removal of a uterine tumour, the place of which it assumed. The closest examination left it uncertain whether this was a second fibrous polypus or a partial inversion. The sound penetrated a short distance all round the tumour. Puncture caused no pain. It was concluded to be a fibrous polypus, which was accordingly removed, with a good result ('Arch. Gén. de Med.,' 1868).

Dr. Matthews Duncan discusses the nature, source, and treatment of hæmorrhage from fibrous tumour ('Edinb. Med. Journ.,' 1867). After referring to the capillary form of hæmorrhage from the surface of the tumour, he gives an example of fatal bleeding from the opening of one of the venous sinuses connecting the tumour with the uterus, resembling the attachment of the ovum. He weighs the operations of incision, enucleation, dilatation of the cervix, avulsion. Some instructive cases are related.

Dr. C. Lorey ('Deutsch. Klinik,' 1867) describes a polypus with nerves; and several cases submitted to operation.

Dr. Playfair discusses ('Obst. Trans.,' x) the subject of the *absorption of fibroid tumours;* he describes two cases in which large

tumours disappeared, under, as he believed, a process of fatty degeneration similar to that by which the uterus undergoes involution after delivery.

Dr. M'Clintock ('Dub. Med. Journ.,' 1868) describes the *spontaneous elimination of uterine tumours* under five heads—interstitial absorption, simple falling, calcification, decomposition, expulsion by uterine contraction.

Dr. Dyce records results of forty cases of polypus ('Edinb. Med. Journ.,' 1867). He insists upon plugging after removal of a polypus by incision. In one case a patient nearly died from hæmorrhage.

O. Larcher ('Arch. Gén.,' 1867) describes the *intermittent appearance* of intra-uterine polypi, *i. e.* appearing, for example, during menstruation or metrorrhagia, at times receding.

Dr. Larcher describes a case of spontaneous rupture of the uterus with intra-uterine polypus. A woman was admitted into the Hôtel-Dieu with pain in the abdomen. After four days profuse bleeding set in. She refused examination. Two days later meteorism and peritonitis appeared and she died. Section revealed diffuse peritonitis and adhesion of all the organs of the small pelvis. A polypus was found in the uterus, seated in the anterior wall near the isthmus. The posterior surface of the cervix was ulcerated, and at one spot torn through, communicating with the cavity of the abdomen ('Arch. Gén. de Méd.,' Nov. 1867).

The *amputation of the cervix uteri,* in malignant disease of the uterus and vagina, is discussed by Dr. B. Hicks ('Guy's Hosp. Reports,' xii). See also A. Valenta ('Memorab.,' 1867); and Küchenmeister ('Oesterr. Ztsc. f. prakt. Heilk.,' 1868).

Removal of the uterus and appendages in a case of procidentia uteri. —A case is related by Dr. Choppin ('Amer. Journal of Med. Sc.,' 1867). It was removed by Chassaignac's écraseur. Recovery.

Dr. Hildebrandt discusses ('Mon. f. Geburtsk.,' 1867) the significance of the levator ani muscle in the use of pessaries.

Dr. Hildebrandt relates two cases in which he was satisfied that he passed the uterine sound several inches along the Fallopian tube. In one case the patient had worn an intra-uterine pessary, and immediately after removing this, passing the sound, he found its point went freely along the tube, and was felt through the abdominal walls. The end of the pessary he conjectured had distended the uterine orifice of the tube, and thus facilitated the entry of the sound, for after discontinuing the use of the pessary the entry of the sound was no longer easy. He refers to analogous cases by Veit ('Virchow's Handbuch der Speciellen Pathologie,' 1867), and by Matthews Duncan ('Edin. Med. Journ.,' 1856). He calls attention to this patency of the tubes as explanatory of those cases in which air or fluids penetrate from the uterus into the abdominal cavity ('Monatsschr. f. Geburtsk.,' June, 1868).

Tuberculosis of the uterus is described by Hoffmann ('Bayr. Intell. Bl.,' 1867). The results of dissection are given. The uterus had grown to the bladder and pelvic wall; its cavity was filled with yellow cheesy matter, and the tubercular mass penetrated some lines into the muscular substance.

Dr. Graily Hewitt describes ('Brit. Med. Journ.,' 1868) under the title "Uterine Lameness," various forms of *flexion of the uterus*. See also on "Flexions," Meadows ('Obst. Trans.,' x).

Granular inflammation of the uterine cervical canal is discussed by Fleetwood Churchill ('Brit. Med. Journ.,' 1868). *Chronic inversion of the uterus* is illustrated by J. Hakes ('Liverpool Reports,' 1868). He relates a case in which reduction was effected by continued elastic pressure. A. Baker ('Brit. Med. Journ.,' 1868) relates a case in which the uterus was removed by the wire écraseur; bleeding vessels were touched by actual cautery. Recovery. Scanzoni relates ('Scanzoni's Beiträge,' 1868) a case caused by a polypus. The uterus was removed by écraseur; there was an opening into the peritoneum; peritonitis followed, and death. The same memoir discusses at length the chief points of interest in recent and chronic inversion.

Ovariotomy.

The contributions are very numerous. The following attest the progress of the operation abroad:

Krassovsky (St. Petersburg).—Before he resorted to it he treated 32 multilocular cysts by tapping, iodine injections, drainage, &c.; 28 died; 4 survived uncured.

In Germany 55 ovariotomies were performed in 1867, with 26 recoveries, 29 deaths. In France and Belgium 34 extirpations are recorded, with an equal number of deaths and recoveries. In Italy two cases are described; one died, the other was not completed.

Amongst unusual events attending ovariotomy are the following:

Keith tells of an intestinal fistula ensuing on opening a large pelvic abscess, after double ovariotomy.

Lyons ('Glasgow Med. Journ.,' 1867) relates a similar case.

Spencer Wells lost a case suddenly on the nineteenth day, under symptoms of obstruction of bowel. The pedicle of the tumour had grown to the ilium, close to the cæcum, and thus caused the closure of the bowel. Berne ('Gaz. Méd. de Lyon') transfixed the stump with a needle; on the fifth day the wound burst at this spot, and the patient died of hæmorrhage.

Koeberlé lost a case on the fifth day, with symptoms of intestinal obstruction. A ligature applied to a vessel, and left behind, had contracted adhesion with a loop of intestine. In another, Koeberlé, diagnosing a fluid collection after operation, opened the abdomen above the crista ilii, and let out 140 grammes of bloody serum; a lumbar abscess was afterwards emptied. The patient recovered.

Lelong relates ('Bull. de la Soc. Anat.,' 1867) a case of *ovarian cyst*, in which puncture was followed by hæmorrhage into the cavity of the cyst; pneumonia, and death. The tumour was generally adherent; the walls were extremely vascular; the blood did not issue from the wounding of any large vessel.

H. Cooper Rose describes ('Med.-Chir. Trans.,' 1868) a case of cystic disease of the kidney, simulating ovarian disease.

The *diagnosis of renal from ovarian cysts* is carefully discussed ('Dubl. Quar. Journ. of Med. Sc.,' 1867) by Spencer Wells.

The *cure of ovarian cysts* without operation is discussed by Courty ('Rev. de Thér. Méd.-Chir.,' 1867).

The following are some of the more important memoirs on ovariotomy and ovarian disease: — Boinet, pp. 459, Paris; O. Spiegelberg, 'Monatsschr. f. Geburtsk.,' 1867; Nussbaum, 34 cases, 'Bayer. ärztl. Intelligenzbl.,' 1867; Keith, 'Edin. Med. Journ.,' 1867-8, and 'Lancet;' Spencer Wells, 'Med. Times and Gaz.,' and 'Med.-Chir. Trans.,' 1867; Koeberlé, 'Gaz. des Hôpitaux,' and 'Gaz. Méd. de Strasbourg,' 1867-8.

H. Cooper Rose describes ('Obst. Trans.,' x) a case of disease of both ovaries; the right ovary communicating with the cæcum and externally, the left tumour emptying into the rectum. Death. Hicks ('Guy's Reports,' 1868).

On so-called *fœtal inclusion*, Hervieux, 'Gaz. des Hôpitaux,' 1867; Giraldès, 'Gaz. Médicale,' 1867. Giraldès' case:—A girl, æt. 17, had a congenital ovarian tumour, which took on rapid growth at 7. The pedicle was divided by écraseur; the patient died on the fourth day; the tumour contained hair, cholesterin, chalk, and fat-glands. Under the title "Fœtal Heterotopia, in form of a Dermoid Cyst," another case will be found in 'Bull. de la Soc. Anat.,' 1867.

II. PREGNANCY.

The Diagnosis of Pregnancy.

W. Lange ('Mon. f. Geburtsk.,' 1867) discusses the value of the *uterine rush*, and of the other auscultatory signs. Dr. Charrier ('Gaz. des Hôp.,' 1867) discusses the significance of the *umbilical cord souffle*. When heard it indicates compression of the cord, and, consequently, an impeded utero-fœtal circulation. The practitioner should be on the alert to deliver. Accidental or natural shortening of the cord may be diagnosed in the last stage of labour by an inversion of the fundus of the uterus at the time of each pain, which inversion is reduced spontaneously after the cessation of the uterine contraction. The proof of this is found in the premature separation of the placenta at its centre, and its rapid expulsion almost immediately after the child.

Dr. Copeman discusses ('Obst. Trans.,' x) some of the difficulties encountered in determining the existence of early pregnancy. In five cases, some complication existing, the pregnancy was established by detecting the "placental souffle."

Dr. Graily Hewitt believed this could not be relied upon.

Dr. Barnes describes ('Brit. Med. Journ.,' 1868) a sign of especial value in the detection of early pregnancy. It consists in the backward stretching of the roof of the vagina, caused by the enlargement and anteversion of the uterus, which, carrying the os and cervix backwards, stretches the attachment of the cervix to the bladder at the vaginal mucous membrane covering the connection. He insists upon the corroborative aid it brings to other signs.

Protracted gestation, for case of, see Rigler ('Mon. f. Geb.,' 1868). J. H. Bond says ('Med. Times and Gaz.,' 1868) a bright red ring encircles the umbilicus of child when gestation has been protracted.

Prof. Dohrn ('Mon. f. Geburtsk.,' 1867) remarks that the conclusion arrived at by Küchenmeister, Fabius, and Wintrich, that *the vital capacity of the lungs* after completed labour is not greater than during pregnancy, is so remarkable as to call for further examination. He has, therefore, examined 100 persons in the Marburg Lying-in Institution, by the aid of the spirometer. All sick persons and those awkward in the use of the spirometer were excluded. An increase of vital lung capacity in puerpery was observed in 60 per cent., the mean increase being 338 cubic centimètres. There was no change in 14 per cent., and there was a diminution in 26 per cent., the mean being 221 cub. centim. The result differed in primiparæ and in multiparæ. In 36 primiparæ the vital lung capacity in puerpery was greater than in pregnancy in 53 per cent., equal in 22 per cent., less in 25 per cent. In 64 pluriparæ it was greater in 64 per cent., equal in 27, less in 9 per cent. Not only was the proportion of cases in which the capacity in puerpery exceeded that in pregnancy greater in pluriparæ, but the mean increase was greater, being for pluriparæ 458 cub. centim. against 244 for primiparæ. This result indicates that primiparæ are more severely affected by labour and the consequences, and are not so powerfully muscular as those who have already gone through a labour. The result given is not due to the younger age of primiparæ. The general conclusion is that the majority of puerperæ have, on the twelfth to the fourteenth day, a greater lung capacity than in the last weeks of pregnancy. The capacity of primiparæ ranged in pregnancy from 1800 to 3600 cubic centim., and in childbed from 1800 to 3700; in primiparæ, in pregnancy, from 1800 to 3450, and in puerpery from 1800 to 3200.

Dr. P. Jassinsky, in an elaborate memoir on the "Structure of the Placenta" ('Virchow's Archiv,' 1867), has the following conclusions:— 1. There are thick villi, which are modifications of the uterine glands. 2. In woman, as in other animals, the chorion villi grow into the uterine glands. 3. In the placenta are found, immediately after birth, two kinds of villi—(*a*) free, ordinary chorion villi, and (*b*) complex villi, that is, villi contained in the uterine glands. 4. The free villi consist of a simple layer of flat epithelium, and of a simple structureless membrana propria. 5. The complex villi consist of two structureless membranes and two epithelial layers, of which the outer one consists of cylindrical epithelium, the inner one of flat epithelium. 6. The number of complex villi is much smaller than that of the simple. 7. Not all the uterine glands are occupied by chorion villi; many remain free. 8. In mature placentæ all the glands, the free as well as those to which villi have grown, show a marked fatty degeneration. 9. From the histological aspect, the tissue of the maternal portion of the placenta belongs to the epithelioid tissues.

Prof. Hegar ('Mon. f. Geburtsk.,' 1867) contests the correctness of Prof. Dohrn's recent researches on the anatomy of the mature human ovum membranes ('Monats. f. Geburtsk.,' xxvi; and 'N. Syd. S. Yearbook,' 1867). Dohrn says the presence of a connective stroma in the decidua vera is rare. To this Hegar answers that Kilian, Kölliker, and Schroeder van der Kolk attest the presence of a fibrous connective tissue; but the denial by Dohrn that the maternal placenta exhibits a

retrograde metamorphosis calls for more special notice. (The reporter observes that alleged retrograde metamorphosis of the decidua of the placenta was first distinctly contested by himself in 'Proceedings of the Royal Med. and Chir. Soc.,' 1853.—R.B.). Hegar has examined twenty mature placentas. He agrees with Dohrn that there is an active new cell-formation in the maternal placenta at the end of gestation. He does not contend that the retrograde metamorphosis of the maternal placenta proceeds at an equal rate with that of the decidua vera; but he believes (as Dr. Druitt first maintained, 'Med.-Chir. Trans.,' 1853) that in mature labours it is always so decided as to account in a great measure for the loosening of the placenta. In twenty mature placentas he found nine had marked calcareous concretions, four with considerable and seven with slight concretions. From these concretions he distinguishes the simple white decolorations of the placental decidua, which penetrate more or less deeply into the parenchyma, and are connected with degeneration of the villi. These are found in every placenta. Generally the fatty degeneration maintains equal progress with the concretion-formation and the decoloration. The fatty degeneration is almost constantly most marked at the circumference of the placenta, and diminishes thence towards the centre. (This is what Dr. Druitt described.) In six placentas the degeneration was not considerable. In the tissues there were opaque molecules. Many of the tissue-elements were quite free ('Mon. f. Geburtsk.,' Jan. 1867). (The reporter submits that these observations do not prove that fatty degeneration is a normal process, preparatory to the casting off of the placenta. The specimens examined were from hospital patients, and were not sound physiological specimens. The calcareous concretions are certainly connected with depraved constitutions, and are of pathological import—R. B.)

Hydatiginous degeneration of the ovum is described by Ancelet ('Gaz. des Hôp.,' 1868), who thinks it due to an independent exogenous force, referable to a peculiar change of the decidua. R. Volkmann ('Virchow's Archiv,' 1868), under the title of "Interstitial Destructive Mole-formation," describes the dissection of a fatal case, in which the uterus was divided into two parts by a transverse septum. The upper part showed no trace of mucous membrane, but the walls were penetrated by villi. In the lower division the mucous membrane was swollen, injected, and both tubes opened into it. The lower division was the proper uterine cavity; the upper resulted from the parenchyma of the uterus being penetrated by the colossal molar growth. A somewhat similar case is related by Dr. v. Jarolsky and Prof. Waldeyer ('Virchow's Archiv,' 1868). The patient also died of hæmorrhages. Many of the mole-bladders were deeply buried in the uterine substance. When a section was made small bladdery villi, on long stalks, were seen in the wall. These proceeded from the inner surface of the uterus; they led into large venous vessels.

Dr. Madden relates two cases of cystic disease of the ovum, and cites the opinions of various authors as to the nature and origin of the disease. He inclines to the conclusion that it may arise in virgin and chaste women—that is, independently of degeneration of placenta. He thinks that some cases may be accounted for on the supposition that

a monstrous growth or morbid action may occur in one of the Graafian vesicles, and that this hydatidiform disease of the unimpregnated ovum may be in some way connected with ovarian disease ('Dublin Quart. Journ. of Med. Sciences,' Nov. 1868).

Dr. Fischer relates ('Ann. d'Hygiène,' 1867) the following: — A young woman, pluripara, delivered herself in a wood, threw the infant (born alive) and afterbirth into a stream and returned to a poor-house. Two months later she passed a mass of hydatidinous placenta. At the base of the mass was a fleshy membranous substance, an atrophied placenta. Near the point of the ovum was a vesicle the size of a grain of coffee, quite different from the hydatids, attached to the walls of the ovum by a whitish cord. This vesicle was considered to be the umbilical vesicle of an embryo that had disappeared. In this case there had been a twin-pregnancy; one of the embryos had died and the ovum had been transformed into an hydatid mole, too adherent to the walls of the uterus to be expelled at the time of labour of the living child. If this explanation be not admitted, it must be concluded that a true superfœtation, or an impregnation subsequent to the labour, had taken place; as the woman was in custody, the latter event was improbable.

See also "Hydatid Degeneration," by Dr. F. Webb ('Obst. Trans.,' ix) and Prof. Martin ('Mon. f. Geburts.,' 1867), who describes three cases in which hydatidiform bladders were present in isolated placental villi, the embryo being completely developed; and J. K. Spender ('Med. Times and Gaz.,' 1867), for a case mistaken for placenta prævia, ending fatally.

Diseases of the ovum are further illustrated in the following:— Extreme fatty degeneration of placenta, Dr. Brunton ('Obst. Trans.,' ix and x). There are some interesting observations on this subject in a memoir "On Fatty Degeneration" ('Bartholomew's Hospital Reports,' 1868), by Dr. E. L. Ormerod. A placenta displaying fibrinous deposits is described ('Obs. Trans.,' ix) by Dr. Barnes.

Diffuse myxoma of the ovum-membranes.—Dr. Breslau ('Wien. Med. Presse,' 1867). During a labour Breslau felt an elastic body resembling the head of a macerated fœtus infiltrated with serum lying in the os uteri. Above this were distinct parts, something like movable cranial bones. Heart-sounds were heard. A tumour-like sac was attached to the membranes. Between the chorion and thickened amnion was a soft mass like Wharton's jelly, consisting of mucin, with traces of albumen. In some spots of this homogeneous ground-substance was a tissue of nearly sarcomatous character.

Dr. Eberth describes ('Virchow's Archiv,' 1867) the same condition. His specimen came from a healthy woman. The membranes were much thickened. On the chorion were numerous fluctuating flat elevations, from the size of a pea to that of a bean. Incision through membranes showed between chorion and amnion a gelatinous mass resembling Wharton's fluid. This gave the reaction of mucin, and traces of albumen. Here and there ran fibrils of connective tissue between the membranes. The substance also held numerous spindle- and star-shaped cells, with one or several nuclei. Amnion and chorion were very tough. The intermediate layer had altogether disappeared, and the myxo-

matous growth did not belong to this, but to the membranes themselves.

The liquor amnii.—Dr. Clinchamps (' Gaz. d. Hôp.,' 1867) describes a case in which the consisteney was remarkable.

Diseases of the Pregnant Woman. By Dr. De Cristoforis.—The Physician to the Ospitale Maggiore, at Milan, in a very admirable report, describes pregnancy as an absolute cause, direct and indirect, of disease in various organs. (1) The mechanical action of pregnancy as a cause of hydraulic derangements in the circulation; of material alterations in the heart, respiratory centre, intestines, kidneys, and skin, and of morbid phenomena in the peripheral nervous system. The compression on the iliac veins by the uterus is a frequent cause of œdema of the lower limbs and pudendum, sometimes even preventing the examining finger from reaching the os uteri. Sometimes a true mortification of the cellular tissues of the labia majora has resulted, leaving a fistula tedious in healing. Sometimes the vulvo-vaginal gland is involved in the phlegmon. The treatment found useful was repeated puncture of the skin, so as to drain off the effused serum from the distended tissues. A fine needle was employed. Ice relieved the irritation from the punctures. If persistent, this œdema of the pelvic tissues becomes a cause of protracted and difficult labour. He relates examples of extreme varicose dilatation of the pelvic veins, in which some relief was obtained by plugging the vagina with tow, thus supporting the distended vessels.

In another order of cases trouble arises from *mechanical superior arterial hyperæmia,* occasioned by the gravid uterus pressing upon the abdominal aorta and the bifurcation of the iliac arteries. This gives rise to an imperfect distribution of blood, in minus to the lower extremities, in plus to the upper parts. The passage of the blood downwards is impeded. A primary effect of this is hypertrophy of the heart, stimulated to stronger efforts to overcome the mechanical obstacle. He thinks this has more influence than the simple physiological nisus aroused to supply the growth of the embryo and uterus, which Larcher thought was the main cause of the cardiac hypertrophy of pregnancy. He generally discovered a soft prolongation and a blowing character in the first sound of the heart in pregnant women, independently of all organic fault. This disappears after labour. Following upon this distress of the centre of circulation come bronchial catarrh, pulmonary œdema, serous diarrhœa, albuminuria, general subcutaneous œdema of the upper parts. He describes the pulmonary œdema thus:—From the fifth to the sixth month there begin cough and slight difficulty of breathing, increasing with the advance of pregnancy, and almost without febrile symptoms; catarrh disturbs rest, and the patient has to sit up in bed at night; *bleeding, even repeated, gives only short and illusory benefit.* At the end of the eighth month the œdema of the lower parts has extended to the upper, fits of dyspnœa cause increased distress, digestion is impaired, the strength is lowered, and a serous diarrhœa aggravates all. Two or three weeks before the term the patient complains of wandering uterine pains, as of preparatory contractions. A

kind of dull, unconscious, slow labour goes on for fifteen or twenty days before true labour can be certainly recognised. The uterus participates in the general adynamia; the sphincter is unable to resist the fœtal part which falls upon it; reflex irritation is set up, and feeble contractions are excited. The orifices once sufficiently dilated, expulsion ensues rapidly, and sometimes without warning. Another feature deserves attention—the separation of the placenta is almost always interrupted, because the contraction of the uterine tissue is slow and imperfect; hence a great disposition to consecutive hæmorrhages. When the uterus is emptied, if no puerperal complication arises, the subsidence of the œdema and then of the circulatory phenomena quickly proceeds. The intestines and kidneys give evident signs of the same hydraulic action. Obstinate serous diarrhœa is the result of the stasis of the arterial and venous circulation of the intestines. Thus also the kidneys—a congestive state is established behind the point of compression of the abdominal circle; the return of the venous blood is retarded, and this remora necessarily extends to the capillaries and arterial circulation. The quantity of blood supplied to the kidneys is thus lessened, and hence these give a diminished secretion of urine, and a sanguineous plasma is effused from the renal capillaries into the tubuli uriniferi, resulting in albumen in the urine. The author habitually examines the urine of all gravid, œdematous, anasarcous women, and says that in the greater part, if albumen was found in the later months, it quickly disappeared after labour. He affirms that too much weight is attached to albuminuria if it be taken as a certain prognostic of eclamptic fits. He has repeatedly seen albuminuric women go through pregnancy, labour, and childbed, without fits. He has also seen cases in which albuminuria was consecutive upon convulsions.

In cases of death following this order of phenomena De Cristoforis found abundant fluid, frothy, slightly red, on cut surfaces of lungs; the mucous membrane of the small intestines swollen, soft, covered with colourless viscid mucus.

The distress described came on at an earlier period of pregnancy when the uterus was unusually distended, as by twins or hydramnios.

He relates an instructive case in which *amaurosis* followed upon the condition described. M. M—, æt. 41, became œdematous at the beginning of the seventh month, then rapidly anasarcous, and was admitted with pulmonary œdema and dyspnœa. The urine was densely albuminous. In twelve days the patient complained of weakness of sight, then of nearly complete amaurosis. On reaching the middle of the ninth month, the symptoms all persisting, a dead ascitic fœtus, macerated, was born. On the seventh day of childbed hydræmia destroyed the patient. Autopsy revealed the usual effusions and the characteristic material alterations of albuminuric nephritis; the left kidney had reached the stage of fatty degeneration. He notices another case of amaurosis, which became chronic.

Another consequence of the distension of the uterus is the stretching of the skin, leaving cicatrices and indelible furrows on the abdomen and the

inner and upper part of the thighs. But he relates a striking aggravated case in which similar scars were found in a woman who had never been pregnant.

He next considers pregnancy as an indirect cause of *sanguineous dyscrasia*, of *organic alterations of the heart*, and *nervous disorders*. On one side there is greater activity of the reducing acts, tending to impoverish the blood; and on the other there is an absolute deficiency in the reconstructive acts, both together leading to anæmia, that is, to aglobulism, hydræmia, oligæmia, leucocythæmia. The earliest effects of this state are syncope, palpitations, vague sensations in the head, classed as headache, tendency to sleep, distress in the limbs, easily induced distress in breathing, dyspepsia, often, says De Cristoforis—referring to ideas prevalent in Italy—interpreted as signs of plethora, and being treated by free bleedings. The loss of muscular tone induces more feeble impulse of the heart; the pulse becomes soft and compressible; the respiratory acts are weakened, inducing deficient oxygenation; the nervous centres, ill nourished, give occasion to syncope, apathy. Nutrition being impaired, the patient emaciates and becomes pale. The loss of fibrin and albumen, rendering the blood thin, disposes to œdemas. If in this state labour supervene, and a moderate loss of blood occur—if labour be protracted—if imprudent movement, as rising in bed, vomiting, &c., take place—the weakened heart is overcome, and death easily follows. The heart, badly nourished, falls into denutrition, its tissue retrogrades, and is supplanted by fat.

The nervous system is variously affected. Obstinate vomiting is one effect. It is to be combated by regulated and nutritious diet, with diet rather than with medicines, which commonly fail. *Asthmatic attacks* and *tonic cramps* deserve special attention. In the first disorder there are no auscultatory signs; it is pure neurosis. In the second the spasm is at first localised in the upper limbs, face, and neck. The general clonic contractions occur. The muscles become painful, the limb rigid; attempts to straighten it cause pain. A febrile condition supervenes. This disorder disappears after pregnancy, but is liable to be reproduced in subsequent pregnancies.

Pregnancy considered as a determining cause in the production of morbid forms predisposed by other causes.—He describes under this head a series of cases of dropsy, or serous effusions in the serous cavities, developed by pregnancy in poor women admitted from the aguish districts, exhausted by frequent labours, suckling, hard work, and malaria. He observes that the dropsies are such as pregnancy can produce alone, and which it is more powerful to produce under the cited persisting conditions. Premature labour was a frequent result. This indication the author insists upon; but in several cases, where advancing asphyxia precluded this, gastro-hysterotomy was performed the moment the last beatings of the heart announced the cessation of life.

As to the influence of pregnancy upon existing nervous diseases, he narrates two cases of epilepsy, which at every pregnancy was greatly aggravated both in the frequency and the severity of the fits ('Annal. Univ. di Med. Milano,' Jan. 1867).

Retroversion of the gravid womb is also discussed by De Cristoforis

(ibid.); and cases are related by Brechler ('Wien. Med. Presse,' 1866) and Fisher ('Liv. Med. and Surg. Rep.,' 1868).

Dr. Grenser relates a case of albuminuria in pregnancy, which has points of interest. A primipara had extreme œdema of the thighs and labia pudendi. Urine contained much albumen. When labour had lasted seven hours, and the child had been driven down to the outlet of the pelvis, progress was arrested by the swollen, stretched condition of the labia. These were punctured with a needle, with immediate good effect; in half an hour the child was born. During the first few days the œdema disappeared from the extremities, but some ascites continued. Pulse rose to 120, temperature to 31·5 C. This gradually lessened along with the albuminuria under digitalis ('Monatsschr. f. Geburtsk.,' Jan. 1867).

Dr. Boulton relates ('Obst. Trans.,' ix) a case of paraplegia occurring during pregnancy. Dr. John B. Tuke ('Edinb. Med. Journ.,' 1867) describes cases illustrative of the *insanity of pregnancy*.

Dr. Skinner describes a case ('Obst. Trans.,' ix) of salivation successfully treated by a mixture of alum, sulphate of magnesia, sulphuric acid, laudanum, and chloroform.

Dr. Paul Davidson gives a case illustrating jaundice in pregnancy. A single woman, æt. 26, was brought in to the Breslau Clinique in labour. She was a large, robust primipara. She had recovered from an attack of cholera when three months pregnant. For the last five or six days she felt depressed and weak, headache, loss of appetite, constipation, but went about her work. Three days ago a yellow tinge of face appeared, and at the same time the urine became like brown beer. The day before admission she had vomiting, and labour-pains set in. Some blood was discharged from vagina during the night. The waters broke and a child was quickly expelled. The placenta soon followed. There was little blood. The uterus contracted. The child, which had died *in utero*, was about 25 weeks old. It was deeply stained yellow, without sign of decomposition. The woman was now intensely icteric, pulse 78, respiration 18, temperature 36·5° C., pupils natural, answers correctly. Percussion in region of the liver was not painful. The dulness began in the fifth intercostal space, and ended with the edge of the ribs. A profuse atonic metrorrhagia set in an hour after labour. It was arrested by cold injections. The uterus continually showed a disposition to relax. Soon vomiting set in, at first of watery clear fluid, with excitation, thirst, then of black coffee-like fluid; blood appeared in the vomited matters. Six ounces of urine drawn by catheter was turbid, dark brown, with yellow foam, copious sediment of uric-acid salts, a marked biliary reaction; no albumen, no cylinders. Vomiting continued, blood always in the ejecta. Pulse remained at about 70. Percussion showed a marked diminution in size of the liver. The *urine* was almost suppressed. Death ensued after increasing collapse and coma within 24 hours after delivery.

The urine, carefully examined, showed abundance of biliary salts and leucin-globules.

Autopsy.—The pericardium contained a considerable quantity of aundice-coloured serum, some small punctated ecchymoses in the mus-

cular substance of the heart near its basis; the papillary muscles showed similar ecchymoses, and the muscular fibres were in state of fatty degeneration, the cells were in advanced degeneration; the ductus choledochus was plugged with mucus. The contracted liver had shrunk quite an inch above the rib cartilages; both kidneys were swollen, the parenchyma soft, stained yellow, and in state of fatty degeneration. Spleen enlarged. The uterus reached above the symphysis. In the broad ligaments were some extravasations of blood. Blood was found in the intestines ('Monatsschr. f. Geburtsk.,' 1867).

Diseases complicating Pregnancy.

Dr. Barnes and Mr. Milne ('Obstetr. Trans.,' ix) give cases and remarks illustrating the history of pregnancy complicated with smallpox. In 4 cases labour set in prematurely; 3 children were born alive, 1 dead. Dr. Barnes discusses the following questions:—1. What is the influence of intercurrent smallpox upon the pregnancy? 2. In what way does it excite premature labour? 3. To what extent is the life of the mother endangered? 4. What is the influence upon the child? 5. Is it desirable to induce labour? Mr. Benson Baker (loc. cit.) had had 7 cases; in all labour set in prematurely, all the children being alive. The reciprocal influence of pregnancy, labour and childbed, on malarial infection, is discussed by Dr. Ritter ('Virchow's Archiv,' 1867). Pregnant women enjoy no immunity from ague; ague does not dispose to abortion; large doses of quinine were not useful; labour arrests the periodical attacks; childbed predisposes to relapse. Dr. Henry Kennedy contributes a number of observations of fever complicating pregnancy ('Dubl. Q. Journ. of Med. Sc.,' 1867). The mortality was small; abortion is sometimes critical; the treatment should not be modified. Dr. Wallichs, practising in Neumunster, observed an epidemic of abdominal typhoid (enteric fever?) ('Mon. f. Geburtsk.,' 1867), and relates two cases in which pregnant women were seized. In both the children were born alive. Wallichs refers to a memoir on the subject by Kaminsky, who submits that the death of the fœtus is not due to the fever alone, but principally to the great increase of temperature that attends febrile diseases. Kaminsky observed restlessness of the fœtus and increased frequency of heart-beat whenever the temperature rose above 40° C.; that the heart ceased at 42° C. to 42·5°. Acting on this theory, Wallichs applied hot cloths to the spine whenever the temperature rose to 40° C. His two patients recovered.

Dr. S. Kersch, of Prague ('Memorab.,' i, ii, 1867), describes the course of cholera in the several trimestral periods of pregnancy in puerpery. In the first period death occurred without abortion; five cases in the second period recovered without abortion; nine cases in the third period recovered, but premature labour occurred in all; all the children, excepting one, were born asphyxiated. In puerpery five cases were observed; all died, mostly in the comatose or typhous stage.

William Sedgwick, in a paper "On the Continuance of the Mammary

Secretion when the Urine is Suppressed in the Choleraic Collapse" ('Brit. Med. Journ.,' 1868), illustrates the same subject. He cites the most authentic information, and concludes that cholera often actually increases the mammary secretion; that menstruation also may occur during the algide stage; that the liability to abortion is, for the most part, limited to the early periods of pregnancy, and that the blood lost on such occasions is not unfrequently florid; and that towards the full term of pregnancy, not only does the liability to abortion usually disappear, but the life of the fœtus may be maintained during a prolonged algide stage.

Dr. Barnes contributes ('Obst. Trans.,' x) a memoir on *chorea in pregnancy*. He tabulates the cases recorded; relates in detail a case observed by himself in which chorea in pregnancy induced mania; discusses the etiology of the disease, and especially the cardiac embolic theory; and advances the theory that the mania and other cerebral symptoms are the result of the repeated shocks of the choreic convulsions, which induce change of nutrition in nervous centres.

Dr. Hughlings Jackson maintained that embolism in the corpora striata was the universal cause.

See also an interesting case of recurrent chorea in two successive pregnancies as reported in the 'Lancet,' October, 1868, by Drs. H. Thompson and Hall Davis; and a case of choreic convulsions and tænia occurring in pregnancy by W. C. Blackett ('Trans. of Newcastle Obst. Soc.,' 1868).

Abnormal (Extra-uterine) Pregnancy.

A rare case of intermural fœtation is described by Dr. B. Hicks ('Obst. Trans.,' ix). He believes that an intermural fœtation continued enlarging towards the peritoneal cavity, and towards the uterine cavity at about the same rate, and at last bulging into the uterine cavity, it burst into this, permitting the escape of the fœtus, and simulating an ordinary abortion. The sac then compressing the placenta retained in it, a large vein just beneath the peritoneum burst, producing fatal hæmorrhage.

Dr. B. Hicks (loc. cit.) relates a case of extra-uterine fœtation treated by abdominal section, with recovery.

Dr. Jacubowitz ('Wien. Med. Presse,' 1867) gives a case of abdominal gestation; spontaneous perforation of the abdominal wall; gradual expulsion and extraction of the fœtus; recovery.

Dr. Fisk relates ('Berl. Klin. Woch.,' 1867) a fatal case, with the dissection.

Professor Eduard Martin ('Mon. f. Geburtsk.,' 1868) describes the following case of Fallopian gestation cured by puncture of the cyst:— A woman, æt. 29, became pregnant for the first time in January, 1867. On 25th February, after exerting herself in moving furniture, she felt a sudden acute pain in the abdomen; a choking sensation and vomiting set in, with straining at stool and urine. The vagina was narrowed, the uterus anteflexed, the body enlarged, the os hard to reach in the hollow of

the sacrum. Some days later, along with considerable hæmorrhage, a piece of decidua came away, and there was felt a small circumscribed swelling behind the abdominal wall, projecting over the left horizontal pubic branch. The bleeding returned profusely on the 16th March, a fresh attack of pain having preceded. On examining now there was decided latero-version of the uterus, the fundus being pushed to the right, the os to the left. In the left side of the pelvis a spindle-shaped swelling was felt through the vaginal wall, and the same swelling was distinguished through the abdominal wall externally. Moving it caused acute pain. These symptoms and the decided growth of the swelling led to the conclusions that it was an extra-uterine gestation, and that the further development ought to be arrested. Dr. Martin punctured the swelling with a fine trocar. A few drops of watery blood followed. Eight days later it was ascertained that the swelling had not increased, but a sharp rigor set in. Some days later the tumour was smaller, and the uterus had recovered its normal direction. On the 4th May the patient was considered well ('Mon. f. Geburtsk.,' Feb. 1868).

Dr. Poppel's case is as follows:—A woman, æt. 29, had borne two living children. She menstruated on the 1st May, 1867. On the 20th June she felt ill with severe abdominal pains. The uterus was found enlarged, and there was a small show of blood, suggesting abortion. Next morning the abdomen was greatly distended, fluctuation was plain, there was acute anæmia and deep collapse, although the hæmorrhage per vaginam had not increased. Fifteen hours after the onset of her illness death ensued. The diagnosis was acute perforative peritonitis, with internal hæmorrhage. *Autopsy*—Much free fluid blood was found in the abdomen. The uterus was enlarged, of irregular shape; its right side was strongly bowed at the fundus, and exhibited on its upper and hinder surface two irregular rents, through which portions of placenta and of a fœtus protruded. The right tube was inserted a little higher on the body of uterus than the left. On opening the uterus lengthwise two cavities were exposed. The lower one, which was the uterine cavity proper, was clothed by a thick decidua. The upper cavity was divided from the lower by a partition of muscular nature, but communicating by a hole admitting the finger; it contained a fresh dead fœtus corresponding to a development of five months. The cavity was clothed by ovum-membranes and placenta. A corpus luteum was found in the left ovary. It followed that there had been a transmigration of the ovum, but whether extra- or intra-uterine could not be determined ('Mon. f. Geburtsk.,' Feb. 1868).

Dr. Dreesen relates that a woman, æt. 35, had had three living children. Pregnant again, abdominal gestation was diagnosed by Professor Litzmann. She dated conception from the middle of June, 1860. Pains and hæmorrhage occurred about the middle period of the presumed pregnancy. The abdomen and breasts enlarged, vomiting often attended the pains. Fœtal movements were felt. She then got better; but in March, 1861, pains lasting a whole week, different from labour-pains, and fœtal movements recurred. These movements grew more feeble and ceased on the 30th March. A sensation of burning in the stomach remained, with severe vomiting of grass-green matter.

Shortly before the death of the fœtus a discharge of blood took place from the genitals, and lasted ten weeks, during two of which it was accompanied with dark coagula, but no membranous shreds. After four weeks the burning sensation was lost. She was now unable to exert herself. The circumference of the abdomen diminished after the death of the child. Menstruation did not return. The position of the fœtus was made out by external manipulation. At a later period menstruation returned. In October, 1866, the patient had been obliged to keep her bed on account of severe abdominal pain, and menstruation ceased again. In January, 1867, she suffered from frequent mucous diarrhœa, through which she became much emaciated. The encysted fœtus was felt as a hard knobby mass, the size of a four-year-old child's head, in the left side of the abdomen, quite immovable. On internal examination the entire brim of the pelvis was found filled with a fixed hard mass. The os uteri was pushed over towards the right pubic bone; much pain was caused in examination from rectum. She sank on the 1st February, 1867. *Autopsy.*—The cyst was found adherent by numerous points to the omentum. The bladder bounded it and was adherent to it in front. The uterus was not greatly enlarged. The mucous membrane looked normal. The left Fallopian tube ran across the wall of the sac. The left ovary could not be discovered. The right tube was found free. The right ovary was also distinct. In the sac was found the remains of the fœtus, macerated. The placenta could not be made out. The inner wall of the sac was covered with a smooth serous membrane. At the point of connection with the rectum there was a fistulous opening ('Mon. f. Geburtsk.,' Feb. 1868).

Dr. A. Halley ('Obst. Trans.,' ix) relates a case in which the greater portion of a dead fœtus was retained in utero for four years. The bones were removed by dilating the cervix. The patient recovered.

H. Ewen ('Brit. Med. Journ.,' 1868) relates a case in which an extra-uterine fœtus was retained, uterine pregnancy and labour subsequently taking place. Recovery.

Dr. Pletzer's case:—M—, æt. 40, had had two children. July 31, 1865, she was seized with sickness and abdominal pains during a sanguineous discharge. Symptoms increased to collapse and peritonitis. These disappeared. Some weeks later the same phenomena were repeated, and subsided. A swelling in the pelvis began to increase, growing more to the left side, and some weeks later the parts of a fœtus could be made out. At the normal end of gestation pains set in, ending with slight loss of blood and the discharge of a completely formed decidua. Six months later sickness, constipation, abdominal pains, collapse, set in, and death in forty-eight hours. *Dissection.*—A large quantity of bloody serum in abdomen, and fresh plastic layers. An embryo of six or seven months' development had passed into the abdomen from a rupture in the left tube, and had grown to the peritoneum and intestines. The fœtus had partially fallen into a state of lithopædion ('Mon. f. Geburtsk.,' April, 1867).

M. Bailly describes a pregnancy in bifid uterus; labour; hæmorrhage; death. The patient died in the service of M. Depaul, at the

Clinique. The placenta had firmly adhered to the septum, between the two uterine cavities. This septum being unable to contract was, M. Bailly thought, the cause of the hæmorrhage ('Bull. de la Soc. Anat.,' 1867).

III. LABOUR.

On the Mechanism of Labour.

Dr. Spiegelberg contends that the *transverse* position of the head at the brim of the pelvis is more frequent than the oblique. In 700 normal cases observed he found 570 heads in the transverse diameter; in an oblique diameter, only 130 heads. The child's back is to one side of the mother; the head, with its sagittal suture, in the longest or transverse diameter of the pelvis. If the transverse diameters of the uterus and of the brim are parallel, the sagittal suture enters transversely; if the transverse diameter of the uterus lies in an oblique diameter of the pelvis, the head will enter the brim in this direction. The uterus, in addition to its common inclination to one side (Dubois), is sometimes twisted a little on its axis in the direction of its inclination.

In whatever direction the head enters the pelvis, in that will it be driven into the cavity, and will only make its rotation on its vertical axis in the lower half of the pelvis ('Mon. f. Geb.,' Feb. 1867).

On the *condition of the uterus in obstructed labour*, and an inquiry as to what is intended by the terms "cessation of labour-pains," "powerless labour," and exhaustion, by Braxton Hicks ('Obst. Trans.,' ix). He maintains that danger attends continuous action, that this is the cause of "powerless labour," and that when the uterus is lax we can wait. See also "Pain and Anæsthetics," by Sansom (ibid.).

Dr. Schröder, of Bonn, discusses the value of the different *methods of measuring the true conjugate diameter* of the pelvis in the living. Having measured many pelves in the living and in museums, he concludes that—(1) The method of Baudelocque has no particular value in the estimation of narrow pelves; for accurate measurement it cannot be used; at best it is only useful as a controlling method. He verifies by examples the experience of Michaelis, who showed that the deduction to be made from the external conjugate diameter, in order to estimate the true conjugate, cannot be assumed as a fixed quantity, but varies extremely. Thus, in 68 pelves (28 normal, 40 abnormal), there were 7 cases in which a deduction of 2″ 10½‴ had to be made; 8 in which the deduction was 2″ 11½‴; 11 in which it was 3″ 1‴; 6 in which it was 3″ 2‴; 9 in which it was 3″ 4‴; 6 in which it was 3″ 6½‴. The deduction necessary ranged from a minimum of 2″ 4½‴ to a maximum of 3″ 7½‴, instead of the final deduction of 3″ to 3¼‴, stated by Baudelocque. The kind of pelvis influences the amount of deduction. Thus, in dried pelves the flat pelvis is distinguished by the greatness, the generally contracted pelvis by the smallness. A radical error arises in this, that in Baudelocque's diameter a measurement is evaded. The promontory in almost every case stands above the line of junction, between the symphysis and the spinous process of the last lumbar ver-

tebra. Therefore, if we add up the thickness of the symphysis, the thickness of the vertebral column, and of the true conjugate, we almost always obtain a greater measurement than Baudelocque's.

(2) The diagonal conjugate is of great importance for the recognition of the degree of pelvic contraction. If we cannot reach the promontory with two fingers, the true conjugate is not much contracted. If we can measure the diagonal conjugate, then we obtain, in a generally contracted pelvis, by the deduction of 7‴; in the flat pelvis, by the deduction of $8\frac{1}{2}$‴; and in the rachitic pelvis, of nearly 9‴—a near approach to the true conjugate.

(3) If we wish to correct the figures so obtained (which it is especially necessary to do in rachitic pelves), and to get the true conjugate as accurately as possible, then we must resort to Van Huevel's pelvimeter. Hitherto this is unsurpassed for accuracy ('Mon. f. Geb.,' 1867).

On the relations between the external and the true conjugate diameters of the pelvis. By Prof. Dohrn.—The results confirm the conclusions of Michaelis, Credé, and Schröder. In the flattened pelvis the subtraction to be made from the external conjugate to arrive at the true conjugate is liable to the greatest variations. The measurement of the external conjugate in the living subject cannot be depended upon as a means of estimating the true conjugate ('Mon. f. Geburtsk.,' April, 1867).

Dr. Carl Martin contributes an elaborate memoir on obstetric and gynæcological weights and measurements. In 1700 measurements he found the distances between the anterior superior spinous processes of the ilia to give a minimum of 18·9 centimètres, a maximum of 31·5, and a mean of 25·4 Out of 1500 measurements this diameter in 451 cases was above 24 and below 25; in 757 it was over 25. He concludes that the proper diameter is 25 centimètres = $9\frac{1}{4}$ inches.

The distance between the crests of the ilia gave a minimum of 24, a maximum of 33·8, and a mean 28·5. The standard distance he concludes to be 28 centimètres = $10\frac{1}{2}$ inches.

The distance between the trochanters justified a standard of 31 centimètres, or $11\frac{1}{2}$ inches, closely agreeing with the measurements of Michaelis and H. F. Naegele.

The external conjugate showed in 1700 measurements a minimum of 16·4, a maximum of 25, a mean of 20 centimètres = 7″ 5‴. This he takes as the standard.

The right external oblique diameter gave in 1500 cases a minimum of 19, a maximum of 27, a mean of 22·6. The left external oblique diameter gave somewhat smaller measurements; the maximum was only 26·5, the mean only 22·5. The mean of the two oblique diameters must be taken at 22·5 centimètres.

The conjugata vera he has determined on 16 dead subjects. He takes 4 inches as the standard. The transverse diameter of the brim he found in 25 dissections of narrow pelves to be 13·2; in 34 middling and large pelves to be 13·8; in the whole 59 to be 13·58. He adopts 13·5 centimètres = 5 inches, as the standard. The oblique diameter he obtains is 12·5 centimètres = $4\frac{2}{3}$ inches. The sacro-cotyloid diameters measure 9 centimètres = $3\frac{1}{3}$ inches.

In 500 mature boys he found a mean weight of 3330 grammes = $6\frac{2}{3}$ lb., and in 500 mature girls a mean of 3220 grammes = $6\frac{1}{2}$ lb.

He found a mean length in both sexes, from head to breech, of 35 centimètres; from head to heels, of 50 centimètres.

The following are the head-measurements:—1st. The anterior transverse diameter, *i. e.* at the lower ends of the coronal suture = 8 centimètres = 3 inches. 2nd. The posterior transverse diameter, *i. e.* between the tubera parietalia = 9 centimètres = $3\frac{1}{2}$ inches. 3rd. The straight diameter, from the glabellæ to the hindermost point of the occiput = 11·5 centimètres = $4\frac{1}{4}$ inches. 4th. The long oblique diameter, from chin to the furthest point of the occiput = 13·5 = 5 inches. 5th. The short oblique diameter, from the foremost point of the neck to the furthest point of the forehead = 9·5 centimètres = $3\frac{1}{2}$ inches.

In 200 cases of mature birth he weighed the after-births. He obtained for the whole after-births a minimum of 350, a maximum of 870, a mean of 585 grammes. For the length of the cord a minimum of 35, a maximum of 102, a mean of 56 centimètres ('Monatsschr. f. Geburtsk.,' Dec. 1867).

Dystocia from the Mother.

Cases of occlusion of the os uteri during pregnancy. By E. Williams ('Brit. Med. Journ.,' 1867); by Wachs ('Mon. f. Geb.,' 1867).

Mr. De la Garde ('Brit. Med. Journ.,' 1868) describes a case of labour with occluded vagina; it had resulted from a severe instrumental labour eight years before. The vagina was opened up by incisions; recovery.

Dr. J. Stephens relates ('Brit. Med. Journ.,' 1868) a case of labour with double vagina and uterus. The septum lacerated during labour; recovery.

Cases of tumours complicating pregnancy and labour are related by E. G. Clarke ('Brit. Med. Journ.,' 1868); C. G. Wheelhouse (ibid.).

Dr. Spiegelberg relates a case of ovarian tumour complicating pregnancy. A woman, æt. 36, pluripara, was delivered prematurely of twins. Soon after, almost sudden sopor and delirium set in. Albumen was found in the urine. Diarrhœa followed. A tumour the size of the fist was felt in the right side. The abdomen became painful and meteoric. Rigor appeared; the pulse and temperature rose. Exhaustion and death on the third day. A large quantity of green, turbid, bad-smelling fluid, mixed with yellow exudation fluids, was found in the abdominal cavity. A tumour covered with blood and layers of fibrin lay in the iliac fossa; it was connected with the broad ligament by a pedicle; no trace of a normal ovary was found. Dr. Spiegelberg is of opinion that the stimulus to growth of the ovarian tumours induced by pregnancy caused thrombosis in its structure, with apoplectic and necrobiotic foci, the rupture of which occasioned the fatal peritonitis.

Dr. Bryce ('Edinb. Med. Journ.,' 1867) describes a case in which a very large renal cyst complicated pregnancy, suggesting extra-uterine gestation. Inflammation supervened, and death took place shortly after the birth of a uterine fœtus.

Deformities of the Pelvis.

Dr. Blasius describes a case of spondylolisthesis; the pelvis and lumbar vertebræ taken from the body of an insane patient. It was not known whether she had ever borne a child. The pelvis was well formed, but the bones were porous and very fragile. The union of the basis of the sacrum with the last lumbar vertebra had undergone considerable destruction through caries; the upper anterior angle of the first false vertebra was completely destroyed, and in its place was a rough sloping surface. The last lumbar vertebra was in great part destroyed, and had slipped forward on the altered base of the sacrum so as to hang as a projection in the pelvic cavity. A year before death the patient had suffered from sacro-coxalgia, which was followed by psoas abscess; abscesses also appeared in the vagina, and Dr. Köppe examining during life had felt an easily reached prominence in the vagina, which he took to be the lumbar vertebræ slipped down ('Monatssch. f. Geburtsk.,' April, 1868).

This case seems a clear proof that spondylolisthesis is not always of congenital origin. The history of the disease a year before death explains the deformity, and congenital or even infantile anchylosis of the sacral joints invariably induces characteristic pelvic distortions and modifications of development.—R. B.

Dr. Fairbank describes a case of fracture of the pelvis with injury to the uterus in the sixth month of pregnancy; recovery; death at a subsequent period ('Obst. Trans.,' ix).

S. Roberts describes and figures (loc. cit.) a remarkable pelvis from a woman the subject of Cæsarian section. It was elongated in the antero-posterior diameter, compressed laterally; the conjugate at the brim measured 4 inches, the extreme transverse diameter was 3·25, thence tapering to a truncated acute angle at the pubes. There was complete anchylosis of the sacro-iliac joint on both sides. It therefore resembles the remarkable pelvis of Robert.

On the diagnosis of the obliquely distorted pelvis. By D. J. Schneider.—The diagnosis of this deformity is unusually difficult. Schneider has tested the value of the rules for estimating the internal measurements by external measurements proposed by Naegele. He concludes that these are untrustworthy; there are no constant relations between the two. He believes a better method consists in observing the form and alterations of position of the sacrum; in the projection of the posterior spine, which approaches the middle line; in the greater elevation of the anterior spine of one side; and by internal examination in the projection of the promontory to one side ('Monats. f. Geburtsk.,' April, 1867).

Kyphotic transverse contraction of the pelvis is carefully described by Dr. Th. Hugenberger ('St. Petersb. Med. Ztschr.,' 1868). He gives the history of the previous writings referring to this deformity; relates a case observed by himself, and describes the pelvis. The kyphotic curvature of the spine induces (1) lengthening of the true conjugate diameter; (2) contraction of the transverse and oblique diameters. The brim is thus a long oval, pointing behind and forwards; the cavity

is an irregular, generally contracted, funnel; the outlet is transversely contracted. In labour the forceps was generally required.

On the knowledge of osteomalacia, especially of old age, and on the presence of lactic acid in osteomalacic bones. By Dr. O. Weber.—The essence of the puerperal form of osteomalacia, as also of the senile form, is, according to Weber, the resorption of the salts of lime, beginning in the walls of the Haversian canals and of the medullary spaces. He has also observed a distinct growth of the cartilage which remains after the resorption of the lime salts, which growth takes place at the cost of the vanishing bone, so that the shape is preserved. This happens under inflammatory symptoms and rheumatic pains. The medulla was found often red, penetrated by small ecchymoses, the vessels of the Haversian canals more developed, and the growing cartilage insulæ surrounded by blood-vessels. Osteomalacia must be regarded as a kind of ostitis ('Virchow's Archiv,' 1867).

In the report of the Milan Lying-in Hospital for 1867, under the direction of Prof. Lazzati, is an interesting case of osteomalacia. This disease appears to be remarkably rife in the neighbourhood of Milan, and is attributed to extreme indigence and bad sanitary conditions. A woman, æt. 34, had three natural labours, but had begun to suffer some pains in the pelvic bones in her first pregnancy. These had seriously increased in her fourth pregnancy, and the pelvis was then deformed. Labour set in prematurely, and was aided by turning. The osteomalacia was suspended after delivery. Again pregnant three years later, the disease returned, and again labour came on fortunately at seven months and ended easily. When pregnant for the seventh time the pelvic pains and the distortion returned in an aggravated form, the whole skeleton being involved so that the circulatory and respiratory organs were seriously impeded. There was intense dyspnœa, cough, difficulty of speech, the slightest movements caused excruciating pains, the face became cyanotic and livid, threatening suffocation. Although she was hardly six months gone, Prof. Lazzati, moved more by the urgent general condition than the pelvic deformity, punctured the membranes. Uterine action set in immediately, and the thoracic distress seemed aggravated by the efforts of labour. A live child was born in 38 hours. The patient died 27 hours after delivery. The thorax was much compressed; the sternum, projecting forwards, assumed the shape of a keel; there was passive congestion and œdema of the lungs, concentric hypertrophy of the heart. The spinal column was distorted. The pelvis was triangular at the brim and extremely contracted. As proof of the brittleness of the bones, there was a fracture of the right femur caused by moving the patient in bed.

Dr. Casati points to the purely obstetric aspect from which osteomalacia is commonly regarded, and dwells upon the effects of this disease upon other parts of the skeleton besides the pelvis ('Annali Universali di Med. Milano,' 1867).

Dr. Casati describes the practice of the Milan hospitals. During 1866, out of 478 women, 47 exhibited pelvic deformities. These are divided into three degrees. In the first degree the conjugate diameter of the brim measured from 3·3 in. to 2·9 in. This was always deter-

mined by the finger, and compared with external measurements with Baudelocque's compas d'épaisseur. The external conjugate almost always corresponded with the internal measurements taken with the finger. In the women belonging to this series labour was completed in some naturally, in some by instruments, in some by induction of labour. The defects of the second degree comprised cases in which the conjugate was reduced to 2·8 in. to 2·3 in. Six such cases were observed. In all labour was either instrumental or provoked. Cases of the third degree included two only, and required Cæsarian section. All the 47 cases, excepting three of osteomalacia, were due to rickets. All remembered to have begun to walk at 3, 4, 5, or 6 years old; that when they began to walk alone they were seized with the disease called *acute fever*, which rendered them infirm; most had lived in damp, unhealthy places, and had been badly fed.

In an inaugural thesis Dr. Aurelio Finizio discusses and expounds what may be considered to be the generally accepted doctrine of the Italian school, as to the management of labour in cases where the pelvis is contracted below $7\frac{1}{2}$ centim. (= nearly 3 inches). He says there are two schools. The first, the older, represented by Prof. Felice di Renzis, opposes provoked abortion on account of pelvic deformity and admits the following practical indications:—(1) From 3″ to 2·50″, the fœtus being alive, symphyseotomy and premature labour; the fœtus being dead, cephalotomia and cephalotripsy. (2) From 2·50″, the child alive, Cæsarian section; the child dead, cephalotomia or cephalotripsy. (3) Below 1·50″, the child dead or alive, the Cæsarian section.

The modern school takes the following indications:—If the woman comes under observation before the seventh month—(1) From 3″ to 2·50″, artificial premature labour. (2) Below 1·60″, obstetrical abortion. At term of gestation—(1) From 3″ to 2·50″, forceps, as an instrument of traction and compression. (2) From 2·50″ to 2·16″, cephalotripsy. (3) Below 2″, gastro-hysterotomy in extreme cases.

Dr. Finizio says the forceps is preferable to turning where the pelvis measures 3″. Contrary to the current Italian precept, he applies the blades in the sides of the pelvis. Cephalotripsy can be executed between 2·50″ and 2″.

In discussing the induction of labour, Finizio lays down these rules:—(1) To time the operation in coincidence with the menstrual nisus. (2) Not to cause congestion of the lower segment of the uterus by Kiwisch's irrigation, this having frequently caused death. (3) To dilate the cervix gradually by dilators. He prefers that of Lemenat des Chénais to Barnes's and Tarnier's.—(From analysis in 'Annali Univ. di Medicina,' 1868.)

Taking the rule of Litzmann, that a pelvis measuring 3·50 and under is a contracted pelvis, Dr. Spiegelberg found 83 labours with narrow pelves in 597. This very large proportion, 13·9 per cent., is explained by the poverty of the lower classes in and near Breslau, and the custom of too early resort to hard work. The greater number of the narrow pelves were simply contracted in the conjugate diameter, the so-called simply flat and rickety pelvis; but more advanced forms of rickety

pelvis presented themselves, two being uniformly contracted, and there were two exquisite cases of obliquely contracted pelvis.

The 79 ordinary cases are subdivided in groups. The first with a conjugate under 3″; 11 labours. In 9 aid was required; 2 were delivered by premature induction of labour; 3 were delivered by turning; in one of them the head had to be perforated; 1 was delivered by forceps; 3 by perforation; 2 of the mothers died; 4 children were born alive.

Second group:—Conjugate 3″ to 3·25″; 45 labours. In 31 cases labour was spontaneous; 27 children living; 4 were delivered by turning, 7 by forceps, 3 by perforation; 6 mothers died; 39 children were born alive.

Third group:—Conjugate 3·30″ to 3·50″; 23 labours. In 20 labours was natural; of these, 19 children were alive; 2 were delivered by turning, 1 by forceps. All the mothers were discharged well.

The two cases of oblique distortion belonged to contractions of extreme degree. In one premature labour was induced. The child died during birth; the mother died of metro-lymphangitis. The pelvis is preserved. The origin of the deformity was traced to injury of the thigh of the side on which the pelvis was deformed. In the third year the patient had suffered a comminuted fracture of the tibia, resulting in a pseudo-arthrosis and permanent shortening of the right leg. The right ilio-sacral joint had undergone synostosis, there was atrophy of the os innominatum.

The other case, one of coxalgic oblique deformity, was also delivered by premature induction. The child died. The mother recovered. ('Monatsschr. f. Geburtsk.,' Oct. 1868).

Dystocia from the Child.

P. Lazzati has an important memoir on some *changes of posture of the fœtus during pregnancy and labour* ('Annali Univ. di M.,' 1867). Face presentations occur almost exclusively in first labours; the children are mostly well developed; face presentations were more observed in twin labours. Lazzati says there are *primary shoulder and face presentations*. *Labour in shoulder presentations* is also discussed in an admirable memoir by Lazzati in the same journal. The subject is further carefully described and illustrated in Dr. Barnes' lectures ('Med. Times and Gaz.,' 1868). Dr. Winckel has collected ('Mon. f. Geb.,' 1867) 376 cases of face labour. They rarely happen, he says, through one cause alone, but almost always through the combined action of two or three factors. The most frequent combination is pelvic narrowing, a large child, scanty liquor amnii; another is pendulous belly, with pelvic narrowing.

Dr. Scharlau relates a case of triplets of an unusual kind. A first child, presenting by head, was extracted alive by forceps. The second, presenting by breech, was also delivered alive. Two completely separate placentas were removed. The uterus contracted; the patient seemed well. Sixty hours afterwards expulsive pains set in and a mass was expelled. This was an intact ovum, with very thick shaggy chorion and a small placenta. The cavity contained stinking liquor amnii, and

a fœtus of the size of three months' development. The remarkable feature was the presence of liquor amnii in the third ovum, since the destruction and mummification of one ovum during the development of the other is commonly preceded by the escape of the liquor amnii ('Monatsschr. f. Geburtsk.,' Oct. 1868).

A case of quintuple birth is related by Dr. Galopin ('Journ. de Bruxelles,' 1867).

Dr. Playfair describes a case of dystocia caused by the child's arm being bent across its neck behind. It became necessary to perforate ('Brit. Med. Journ.,' 1867).

The Umbilical Cord.

Dr. Birnbaum gives an historical *résumé* ('Mon. f. Geburtsk.,' 1867) of the plan of replacing the cord by putting the woman in the knee-elbow position. He quotes Deventer, 1701, others since, and Ritgen, 1848, as recommending it. Birnbaum has often practised it.

Dr. Massmann ('Petersb. Med. Ztschr.,' 1868) discusses the subject of prolapsus of the cord in detail. See also Trend ('Obst. Trans.,' x).

Operations and Instruments.

Kristeller ('Berl. Klin. Wchnschr.,' 1867) discusses the application of *external pressure as a means of delivery* in substitution for extraction by forceps. The hands are applied one on either side of the fundus and sides of the uterus, and pressing downwards towards the pelvis; whilst compressing the uterus laterally the child is squeezed out. This action is repeated at intervals. In certain cases where labour is arrested from simple inaction of the uterus, and where the relation of the axis of the uterus to that of the pelvis is faulty, this method is calculated to be of great value. It is further described in Dr. Barnes' lectures ('Med. T. and Gaz.,' 1867), and by Dr. A. C. Scharf ('Nederl. Tijdschr.,' 1867).

Air as a means of delivery.—Dr. Kauffmann ('Gaz. des Hôp.,' 1867) states the following propositions:—Rarefaction of the air between the ovum and the uterus is necessary to the adhesion and growth of the ovum; entry of air between ovum and uterus is necessary to separation and birth of the embryo. Kauffmann says during labour-pains there is access of air between the uterus and the ovum; and if, by means of the hand or the blade of a forceps, air is admitted behind the ovum, labour is facilitated.

Dr. Inglis proposes a new form of forceps. The principal modification consists in doing away with the ordinary handles, reducing these to the shoulders or stumps. He contended that good blades would hold by themselves; and that if traction be the principal use, the handle ought to lie across the line of traction like the handle of a corkscrew. Dr. Charles Bell and Dr. Keiller vindicate the old form of handle, showing that want of length is simply want of power, and urging the difficulty of keeping the blades *in sitû* if the handles were stumped ('Edin. Med. Journ.,' Feb. 1867).

Dr. Aveling ('Obst. Trans.,' x) proposes to curve the handles backwards, by which, he says, the grasp and power of traction are in-

creased. The structure and powers of the forceps are minutely discussed in Dr. Barnes' lectures ('Med. Times and Gaz.,' 1858).

Dr. Casati describes ('Annal. Univ.,' 1867) the indications and rules for using the forceps in Milan. This instrument was resorted to 12 times in 478 labours; in 9 to the head at brim of the pelvis, in 3 when head was in cavity; the blades were applied over the temporo-parietal regions of the head, so as to seize in the most reducible diameter, and keeping the pelvic curve directed towards that part of the fœtal head which had to be conducted under the pubic symphysis. The instrument used is that of Professor Lovati, preferred on account of its length and its power of compressing the head, and thus avoiding turning or craniotomy. The range of pelvic deformity in which the forceps was used was from 2·9 in. to 3·2 in. conjugate diameter. Three of the children were born dead; of the mothers, 4 died, namely, 3 of puerperal fever, 1 of eclampsia.

Professor E. Martin discusses the use of *turning in contracted pelvis*. He denies the proposition that the head enters the brim with more facility base first if the child is living. He insists that when the vault presents, moulding may go on gradually and safely for hours, whereas if the base come first the moulding must be effected by force and within five minutes in order to save the child. He points to the importance of getting the smaller or bi-temporal diameter of the head into the contracted conjugate diameter, and the occiput with the greater or bi-parietal diameter into the larger side of the pelvis. This may be effected in three ways:—(1) By a fitting position of the woman. Let her lie on that side towards which the forehead is directed; the fundus of the uterus will gradually sink with the pelvic end of the child to this side; the spine draws down the occiput to the opposite side of the pelvis, and the forehead goes more deeply towards the middle of the brim. Martin refers to a case in which he successfully executed this, the pelvis measuring only three inches. (2) The forceps is a means of releasing the engaged posterior or larger transverse diameter from being locked in the conjugate. This explains the frequent easy extraction when a little traction is made. This method is indicated when signs of exhaustion or of need for delivery exist. But it must not be trusted to overmuch; he must be prepared to perforate. (3) Turning by the feet. When this has been done, Martin has always found the depression caused by the promontory to be on the temporal bone. In many of these cases he found, after some hours, signs of blood-effusion in the cranium, *ex. gr.* convulsions in the face. He thinks turning is advisable only when the transverse diameter of the pelvis is great enough to allow the occiput to pass by the side of the promontory.

In the case of one-sided distortion of the pelvis turning is hardly admissible. Martin refers to cases in which, the occiput descending in the narrow half of the pelvis, delivery had to be accomplished by perforation, whereas when the occiput was turned to the normal side of the pelvis the forceps delivered easily. This occurred in the same patient. He also gives cases in which, the occiput being unfavorably situated, a face-presentation was developed. This happened twice in the same woman under his own observation.

The indication for turning in narrow pelvis occurs when it is possible to bring the smaller anterior diameter of the head into relation to the narrowed conjugate, and the occiput into the larger half of the pelvis; and when this more favorable position of the head cannot be effected by placing the woman in a fitting position. He then asks, can the head be so placed by turning? In consequence of the known law that in incomplete foot presentation the foot that is drawn down always comes under the pubic arch if the fœtus is not abnormally small or the pelvis too large, in drawing down the right foot the child's back and also its occiput will come into the right half of the uterus, and *vice versâ* ('Mon. f. Geburtsk.,' 1867).

Dr. Shassmann ('Mon. f. Geb.,' 1868) discusses turning in narrow pelvis. He says it may be successful although the bi-parietal or greatest diameter of the child's head be caught in the narrowed conjugate. Shassmann insists much upon the importance of aiding extraction of the head by pressing upon the head through the abdominal walls.

Dr. Scharlau (loc. cit.) gives a summary of 64 cases in which he turned; 50 of the children were alive before the operation; of these 43 were delivered alive; 5 mothers died, 2 of metro-phlebitis, 1 of peritonitis, 2 of ruptured uterus. In 12 cases there was narrowed pelvis. He shows 4 cases in which the head was caught near the bi-parietal diameter. He thinks the operation may give good results with a conjugate reduced to 3 in.

Dr. Gosselin describes ('Wien. Med. Presse,' 1867) a peculiar method of extracting the head in breech labours.

Under the title "Forceps or Turning," Th. Körner discusses ('Deutsch. Klinik,' 1867) the same question, with illustrative cases; also by H. Schwarzchild (Memoir, Frankfurt, 1867), who approves of turning.

The subject is also discussed and illustrated in Dr. Barnes' lectures ('Med. Times and Gaz.,' 1868).

Cephalotripsy.

This operation has obtained a firm footing in England within the last few years. At the British Association meeting held in Dublin, 1867 ('British Med. Journ.,' 1867-8), Dr. G. Kidd, Sir J. Simpson, Dr. Braxton Hicks, and Dr. Ringland exhibited cephalotribes. Dr. Kidd's instrument is straight, Dr. Hicks' is a modification of Sir J. Simpson's, having a moderate pelvic curve, short handles, working by a screw, the English forceps-lock. Dr. M. Duncan ('Edinb. Med. Journ.,' 1868) prefers the French model, and has modified this, producing some improvements, but retaining the essential features of Baudelocque's instrument. He contends that the short-handled English models are unable to crush in the base of the fœtal skull.

Prof. Chiara, of Turin (1867), describes a case in which the repeated crushings alternating with intervals for moulding were practised. The shoulders resisting, a strong cord was passed round neck, and attached to Joulin's *appareil à traction*. By this means in a few minutes the body was delivered. The woman did well.

The Cæsarian Section.

In an elaborate work on the *Cæsarian* section, Dr. Testa discusses the history, statistics, and other points; and especially investigates the following:—In some cases the wound in the uterus is found after death gaping, in others closed. Testa set himself to discover upon what this difference depended. He minutely examined the muscular structure of the uterus. He found that when the incision is so made as to fall in the line of direction of the fibres, the lips of the wound will be maintained in apposition; but that when the wound cuts across all the layers of muscles, gaping must follow. The gaping will be the greater the longer the fibres are which are divided, and will increase with the uterine contractions; and since the external muscular fasciculi are longer than the internal, it is clear that the retraction of the first will predominate, and cause the divergence of the margins of the wound. Thus, he observes, that when the incision fell upon the fundus, cutting the transverse and oblique fibres proceeding from the Fallopian tubes, the wound gaped, owing to the retraction of these fibres towards their points of origin. And when the incision was made transversely from one of the sides, so as to spare the longitudinal fibres of the tubes, the edge of the wound would be drawn together. In the lower third of the uterus wounds made in the direction of the long axis would present the margins in contact, the longitudinal fibres being spared; but since the neck becomes distended and relaxed during the latter months of pregnancy, it follows that the borders of the wound are kept apart by the divided and stronger transverse fibres. The gaping would be greater if the incision were oblique, so as to divide all the orders of fibres. It is true that the anatomical structure of the middle third is the same as that of the lower third, but at this point, the longitudinal fibres not having suffered distension, and preserving their tonicity, are fit to maintain in contact the margins of wounds made according to their direction.

The application of these researches follows:

(1) Incisions in the uterus made in the axis of the body, in the upper third, remaining open, give rise to escape of lochia into the abdominal cavity, setting up peritonitis.

(2) This may be avoided by making the incision transverse and lateral, but this is to be avoided on account of the risk of dividing large vessels.

(3) Oblique and longitudinal incisions in the lower third equally dispose to effusions and peritonitis.

(4) Testa recommends to make the incision transversely and on one side, a little above or below the insertion of the tubes, so as to avoid an order of fibres (the longitudinal of a tube before they become oblique), and thus avoiding all obstacle to the approach and union of the lips of the wound. He relates that Dr. Cocchi, of Rome, having followed this advice, saved mother and child.

Dr. Testa then examines the various modes of applying sutures to the incised uterus. He objects to most of those proposed, and suggests one of his own. It consists in inserting two long needles at the level of the upper angle of the incision at a distance of four lines from it, from

without inwards, through the abdominal parietes; then in making each needle penetrate the thickness of the corresponding lip of the uterine wound throughout its whole length, and always at the same distance from the margin; this done, the needles are brought out from within outwards, at the level of the lower angle of the wound. Care must be taken not to pierce into the cavity of the womb. Then a thread is twisted round the upper ends of the needle, and another round the lower ends; the rigidity of the needles suffice to keep the edges both of the abdominal and uterine wounds in apposition. Then straps of adhesive plaster are applied. Thus parallelism is preserved within the wounds, the escape of matter into the peritoneum is avoided, and the protrusion of intestine is prevented (analysis in the 'Annali Univers. di Medicina,' 1868).

Prof. Dohrn reports a case in which the Cæsarian section was resorted to on account of a fibroid tumour seated in the posterior wall of the pelvis. The subject was a primipara. Labour having fairly set in, the operation was performed. Child alive. The mother died on the sixth day. Peritonitis was found. The pelvis was contracted generally, as well as by the tumour which sprung from the right upper part of the sacrum and projected into the cavity. The pelvis is figured and minutely described ('Monatsschr. f. Geburtsk.,' 1867).

A case is related by H. Roberts ('Obst. Trans.,' ix). She died on the sixth day of peritonitis. (See *Deformities of Pelvis.*) Dr. Greenhalgh exhibited (loc. cit.) the uterus of a patient upon whom Cæsarian section had been performed on account of epithelioma of the cervix; death from the disease six months after operation. The incision was reduced to one inch. See Dr. Grenser ('Mon. f. Geburtsk.,' 1867). Death on fourth day from peritonitis; extreme contraction of pelvis.

Dr. Casati describes two cases in which *Cæsarian section* was performed, both times on account of pelvic deformity of the third degree from rickets. Consecutive hæmorrhage occurred, and death the following day ('Ann. Univ.,' 1868).

Dr. B. Hicks ('Obst. Trans.,' x) relates a case of Cæsarian section. There was a pelvis oblique-ovata. The child survived a month; the mother died of peritonitis ninety-six hours after operation. Dr. Hicks had punctured the flatulent intestine with a fine trocar. He had done this in four cases of tympanitis with great relief, and without any mark of the operation afterwards. He dwelt upon the disadvantage of operating before labour set in, from the tendency to closure of the cervix; he thought the uterine wound might be closed by the same suture used for the abdominal wound.

The Cæsarian section is further discussed by Dr. Radford ('Brit. Med. Journ.,' 1868). Nineteen cases are tabulated.

Induction of Labour.

Prof. Lazarewitch ('Obstr. Trans.,' ix), in a memoir on this subject, lays down that excitation of the uterus to contract is effective in proportion as it is applied near to the fundus; that a stream of water injected by a catheter carried to the fundus is much more efficacious than when simply injected inside the os uteri; that the proceeding is

easy and safe. He gives successful cases. (The reporter thinks it incumbent not to omit to call attention to the fact that many cases of sudden death have followed analogous proceedings for inducing labour.)

Dr. Barnes ('St. George's Hospital Reports,' 1868) describes and illustrates by cases a plan of inducing and completing labour at a predetermined hour, so as to secure greater safety to mother and child. He points out that in premature labour two obstacles have to be contended against, the immature development of the uterus implies greater resistance of the cervix and less contractile power in the body of the uterus; and hence, he shows, that art is likely to be required to dilate the cervix, and to supplement the defective uterine force. The water-dilators effect the first, and turning or the forceps the second. The whole is completed in twenty-four hours.

Induction of labour was performed in twenty-three cases at the Milan Hospital in 1867, and it is remarkable, as evincing the care with which the patients are examined, that thirteen of these were primiparæ. In twenty cases the indication was pelvic contraction. The means employed were simple puncture of the membranes, sponge-tents, laminaria, and the elastic syringe. Fourteen children were born alive.

The proportion of stillborn children, in labours of all kinds, was about 8 per cent., which exceeds that which prevails in England ('Annal. Univ.,' 1868).

Instruments.

Gynæcological.—An expanding speculum and self-retaining tenaculum, R. Ellis ('Obst. Trans.,' ix). Ecraseur with single steel wire, Dr. Meadows (loc. cit.). Carbolized sponge-tents, R. Ellis and J. H. Aveling (loc. cit.). New uterine sound, with metroscope attached, Meadows (loc. cit.) A modification of Hodge's pessary for relief of anteversion, G. Hewitt (loc. cit.). Another modification for retroflexion, by Dr. Greenhalgh ('Obst. Trans.,' x). A new uterine sound is proposed by Dr. Sappolini ('Annal. Univ.,' 1868). He makes it more flexible, and calls it *hysterolygismus*, from λυγισμός (flexion). Dr. Rasch ('Obs. Trans.,' x) describes a *vaginal drainer* for the purpose of irrigating the vagina and uterus. Dr. Wiltshire describes (ibid.) a new utero-vaginal douche. Drs. Meadows and Sansom describe (ibid.) new forms of medicated pessaries. Dr. John Murray describes (loc. cit.) a very convenient pocket chloroform-inhaler.

Obstetrical.—A perforator, Dr. Cleveland ('Obst. Trans.,' ix). A tire-tête, or combined perforator and extractor (loc. cit.). A drill-crotchet, Dr. Eastlake (loc. cit.). On the forceps, Dr. Dieterich ('Mon. f. Geburtsk.,' 1868). Dr. Byford, of Chicago, describes ('Obst. Trans.,' x) a new pelvimeter.

The operation for *torn perinæum* is discussed ('Deutsch. Klinik,' 1867) by Prof. C. O. Weber. His view of the nature of the injury and of the operation differs from that in vogue.

Dr. Grenser relates ('Mon. f. Geb.,' 1867) that out of 35 lacerations treated by him, immediate application of one, two, or three sutures, all healed excepting two.

Hæmorrhage.

Placenta prævia is illustrated by cases by G. Roper ('Obst. Trans.,' viii); he attests the views of Barnes that hæmorrhage may cease during dilatation of the os uteri. By W. Holt ('Brit. Med. Journ.,' 1868), who used successfully Barnes' dilator. By J. F. W. Staude ('Ztsch. f. M. Ch. u. Geb.,' 1868) who proposes a special contrivance, consisting of two pewter tubes united parallel and a caoutchouc bladder attached to carry cold water, and thus to combine the use of cold and the plug. Dr. Kuhn ('Wien. Med. Puss.,' 1867) gives the results of his experience of 46 cases. By Dr. Fowler ('Lancet,' 1868), who relates a striking case in confirmation of Barnes' doctrine, that hæmorrhage may cease during the dilatation of the cervix. "On Hæmorrhage from Placenta Prævia, and its influence on the Death of the Fœtus" is the title of a memoir by Lehmann ('Nederl. Pijdschr.,' 1868).

Cases of *transfusion*, with some remarks on a new method of performing the operation, by J. B. Hicks ('Guy's Reports,' 1868. Dr. Hicks advocates preventing the coagulation of the blood by the admixture of a solution of phosphate of soda; 3 gr. of the fresh phosphate should be dissolved in a pint of water. This should be added in the proportion of one fourth to the blood. The instrument employed was the gravitation one of Dr. Hamilton. He relates 6 cases; two were treated on the old plan, four on the new plan. All died; but enough is advanced to arrest attention to the method.

The use of the neutral chloride of iron as a styptic is discussed by G. Braun ('Wien. Med. Wochnschr.,' 1867).

Injuries.—Rupture of the Uterus and Vagina.

Dr. C. Hecker relates two cases of laceration of the uterus during labour in illustration of a proposition submitted by him, that, "When during a labour, which, perhaps, has already exhibited a suspicious character, a quickly increasing, smooth, elastic swelling forms in the anterior wall of the vagina, and which cannot be regarded as due to prolapsus or cystocele, the existence of an incomplete rupture of the uterus is highly probable." This is due to the collection of blood in the cellular tissues uniting the bladder to the cervix uteri; an extra-peritoneal ante-uterine hæmatocele. Case 1.—A woman was in labour with her ninth child; the midwife felt no presenting part, but she perceived a peculiar swelling in the anterior vaginal wall; in the evening a copious hæmorrhage took place. The swelling persisted after the bladder was emptied by catheter. On passing hand into vagina the head was felt; the pains were strong and regular, the countenance calm, but the pulse was over 120. Hecker felt a rent in the left side of the lower segment of the uterus. Turning was readily accomplished, but the head, enlarged (hydrocephalic) had to be perforated. After labour the pulse rose to 140. Delirium set in, followed by rapid collapse and death 36 hours after labour. No autopsy.

Case 2.—A woman in her eleventh pregnancy had frequent hæmorrhages; the posterior lip of the os was carcinomatous. In labour the head presented. When the waters had escaped a smooth elastic

swelling was felt in the anterior vaginal wall. This was not affected by emptying the bladder by catheter. The patient sat upright, her legs hanging over the edge of the bed, and strained forcibly with the quickly recurring strong pains. These were attended by hæmorrhage. Her countenance was tranquil, breathing but little hurried, but the hands were cold, and the pulse small and 156. She sank undelivered. The child was delivered by turning afterwards. *Autopsy.*—The uterus was large, flaccid; a large extravasation of blood was found under the peritoneum extending upwards as far as the right kidney. An incomplete rupture of the uterus was seen proceeding from the vagina. In the cellular tissue, between bladder and uterus, was an extravasation of blood.

Hecker insists upon the occurrence of rapid small pulse as a sign of diagnostic value in incomplete as well as in complete ruptures ('Mon. f. Geburtsk.,' April, 1868).

M. Jolly discusses the same subject. He saw in the Maternité two cases of rupture of the uterus, in both of which the contractions went on even after the accident; in one case they were sufficiently energetic to expel the child. This circumstance seemed to be so rare that he searched for other cases, and collected the histories of 23 cases in which the uterus showed contractile energy after rupture.

He discusses the explanations given to account for the continuance of the contractions, and successively rejects them as contradicted by clinical facts. M. Baudelocque's theory, that the fœtus present in the uterus excites its contraction, is disproved by cases cited there; contractions occurred even after the child and placenta were expelled, and others where the contractions ceased although child remained in uterus. Another theory, urged by Ramsbotham, is that a large rent caused suspension, a small one contractions. Jolly adduces cases in contradiction of this also.

Nor does the explanation lie in the seat of the rent, as Pajot suggested, for contraction has been absent and present in ruptures at the fundus and at the cervix.

Jolly insists upon a diagnostic sign noticed by M'Clintock. This is the formation of a tumour in the iliac region, formed by a mixture of blood and gas, recognised by a sound of crepitation and a sensation of emphysema. Another sign is the formation of a tumour of effused blood in the hypogastric region, simulating the distended bladder, and not disappearing on catheterization. These are not constant, but valuable when present. The conclusion is that, suspension of contractile energy being no certain or constant sign of rupture, we must study carefully all the signs, not so much in isolation as in their accumulation ('Archives Gén. de Méd.,' 1868).

Mr. E. Asbury contributes ('Obst. Trans.,' x) a case of *rupture of the uterus;* the pelvis was normal. In relation to this case Dr. Barnes expressed his opinion that, as in many other cases, the rupture might, in this, have been due to the uterus contracting upon a dead child.

Case of spontaneous rupture of the uterus. By Dr. Scharlau.—Pelvis generally and obliquely contracted; second labour; spon-

taneous rupture; escape of child, with exception of the head, into the abdominal cavity. Cephalotripsy, turning, death. The following measurements of the pelvis were made:

True conjugate	= 8·5	centimètres.
Transverse	= 12·6	„
Left oblique	= 11·8	„
Right „	= 11·0	„* ('Monats. f. Geburtsk., Feb. 1867).

A fatal case occurring during pregnancy is told by R. Dunn ('Obstet. Trans.,' ix).

A remarkable injury of the uterus is described, under the title "Traumatic Aneurism of the Uterine Artery," by Dr. G. Hewitt (loc. cit.). A woman, the fourth day after labour, was knelt upon by her husband; pain, tympanitis, and successive hæmorrhages followed, and death. Peritonitis and an abscess communicating with the uterine cavity were found, and a sac described as an aneurismal pouch communicating directly with the uterine artery.

Spontaneous rupture of uterus, fatal case, J. Cullingworth ('Lancet,' 1867); also a case by H. M. Madge ('Obst. Trans.,' x).

A. B. Steele relates ('B. Med. Journ.,' 1868) a case of *laceration of the vagina;* recovery.

A case of utero-intestinal fistula following a difficult labour, M. Demarquay ('Gaz. Méd.,' 1867). The fistula was believed to be formed between the uterus and the small intestine. All the fæcal matters passed through it.

Dr. M. Duncan relates ('Edinb. Med. Journ.,' 1867) a case of abscess of the symphysis pubis. A difficult labour was ended by forceps. The patient could not use her legs for three weeks after. A fissure was found along the urethra; a probe could be passed three inches behind the symphysis, which could be felt and heard to move; three days later the finger could be passed into the pubic joint. Much pus was discharged. Cartilage came away. Recovery.

Dr. Ercole Galvagni contributes a valuable memoir on the diseases of the pelvic symphyses in pregnancy, labour, and childbed ('Rivista Clinica,' 1868). He discusses them under—1. Relaxation of the symphyses. 2. Suppurative inflammation. 3. Laceration of the symphyses. Galvagni collects the published cases of each, and describes the etiology, course, and treatment. The memoir constitutes the fullest exposition of the subject.

Two cases of *peri-vaginal hæmatocele* (thrombus) attending labour are related by D. Gantvoort ('Nederl. Tijdsch. v. Geneesk.,' 1867). They were punctured; recovery. Dr. A. Geissler relates ('Ztschr. f. Med. Ch. u. Geb.,' 1867) a case of thrombus of the vagina during labour.

Inversion of the uterus.—Dr. Woodman relates ('Obstet. Trans.,' ix) a case of chronic inversion which had lasted more than five years without serious symptoms.

Dr. Schnorr relates the following recent case:—A primipara was delivered by forceps of a child presenting in first position. After press-

* In the Appendix to the new 'British Pharmacopœia' are tables giving the relations of the metrical measures to the English.

ing upon the fundus uteri to drive down the placenta, and drawing upon the cord, the placenta came down attached to the inverted uterus. He separated the placenta, and immediately reduced the uterus. The uterus then contracted. The patient had slight peritonitis, from which she recovered, to die later of phthisis ('Mon. f. Geb.,' July, 1867).

Dr. Inglis relates a case ('Ed. Med. Journ.,' 1867), and expounds the theory that the cause is found in the head presenting in the occipito-posterior position. The occiput rubbing round against the inner surface of the cervix produces an extremely complete and extensive dilatation, and in time also an increased expulsive action.

C. R. Roberts ('Brit. Med. Journ.,' 1868) relates a recent case in a pluripara. It was re-inverted; recovery.

Dr. Matthews Duncan describes the subject with great care. He says—Four kinds of inversion occur after delivery. 1. Spontaneous passive uterine inversion. 2. Artificial passive. 3. Spontaneous active. 4. Artificial active inversion. The only uterine condition essential to the production of all these kinds is paralysis or inertia, or complete inaction. This is the condition of the whole organ at the time of the production of the first two kinds. In the last two kinds it is accompanied by uterine activity, *i. e.* there is partial activity, partial inertia. Activity of the whole of the uterus makes inversion impossible. Activity of a part of the uterus renders introcession of that part impossible. There must, therefore, be paralysis of the whole or a part before inversion can be begun. The paralysed part that falls in is generally the placental seat. Action takes place below this in the form of an hour-glass contraction. Hour-glass contraction cannot exist unless the parts above the contraction are in a state of inertia, for were the higher parts of the uterus in even moderate action the hour-glass contraction would soon be overcome. Dr. Duncan's account of the passive forms of inversion does not differ materially from those generally known. Spontaneous active inversion occurs in the following way:—Bearing down presses the paralysed portion of the uterus into the cavity; this is seized by the adjacent contracting segments of the uterus, is pushed down, and expelled through the uterus ('Edinb. Med. Journ., May, 1867).

Dr. Tyler Smith relates ('Obst. Trans.,' x) two cases of inversion, one being observed throughout the process of occurrence. The mechanism was quite spontaneous, no dragging upon cord being used. H. S. Shaw relates (loc. cit.) a case in which reinversion took place spontaneously.

Dr. Haussmann ('Mon. f. Geb.,' 1868) refers to other known cases of casting off of portions of the vesical mucous membrane, and relates the following:—A woman, æt. 39, who had borne a child, was seized when three to four months pregnant with retention of urine requiring frequent use of catheter. The uterus was found retroflexed. This was relieved. The temperature and pulse normal. The urine was at times alkaline, and showed cells of epithelium falling into decomposition, and vibriones. There was at times extreme pressure to void the bladder, which the patient could not satisfy. She several times passed the catheter her-

self. She recovered. A substance which at one time seemed to have choked the eyes of the catheter was passed, some blood following. This substance corresponded in size to about the fourth part of the area of the bladder. It had several small holes, most probably artificially produced, but one of which possibly answered to the opening of a ureter. One surface was tolerably smooth, the other surface showed numerous beam-like processes, which penetrated the entire membrane. It consisted of fibre and elastic fibres, and many epithelial cells exactly like those of the bladder.

III. THE PUERPERAL STATE.

Changes wrought by Labour.

M. Carcassonne has applied an instrument of his construction, designed to measure the force of the uterine contractions, to the determination of the evidence of the existence of a *cavity in the uterus after delivery*. It consists of a canula, having a small bladder attached to the end, which is introduced into the uterus. The end introduced can be made to describe arcs of circles in the uterus without meeting resistance; and again, if water be injected into the bladder, and this is not then equal in size to the capacity of the cavity, then by moving against the uterine walls, one gets the conviction that these are not in juxtaposition ('Gaz. Méd.,' Oct. 1867).

Dr. Duroziez has studied the question of *the enlargement of the heart under pregnancy*, on 135 women. Taking the normal area of the heart in non-pregnant women to be 9 centim. high and 12 centim. wide, he arrived at the following conclusions:—(1) That the enlargement during pregnancy may be determined. (2) That during the first day after labour the left cavities of the heart diminish, the right remaining enlarged. (3) That at the time of the milk-flow, about the third day, the heart becomes elongated; it remains enlarged during suckling, and diminishes when the woman does not suckle. (4) That in women who have had many children the heart is larger than in those who have only had one or two ('Gaz. d. Hôp.,' 1868).

The *temperature and pulse-relations of lying-in women* are discussed by Dr. Gruber (Inaug. Diss., Bern., 1867). The same subject is also investigated by W. Squire ('Obst. Trans.,' ix). He concludes that no great elevation of temperature arises in natural labour; that there is afterwards a considerable fall, which is favoured by sleep; that there is a subsequent rise, which has for its natural termination the secretion of milk. Dr. R. Baumfelder made observations (see 'Mon. f. Geb.,' 1867) on 226 lying-in women. His conclusions confirm those of other observers. He makes the remark that the study of slight forms of parametritis and perimetritis led to the result that pain is preceded for several hours, even for a whole day, by elevation of temperature.

Dr. Credé submitted to the Obstetric Section of the Meeting of Physicians, &c., held at Dresden in 1868, the general conclusions drawn from observations on the temperature of lying-in women, conducted for several years. The observations were arranged in groups:—(1)

Normal temperature, never exceeding 38° C. (2) Rising of temperature about the third day, with quick return to the normal, indicates—milk-flow to the breasts, cracks of the nipples, slight bruisings and injuries of the genital canal, painful after-contractions. (3) Rising of temperature on the 4th, 5th, or 6th day, with speedy fall to the normal—generally constipation, at times no material cause, frequently errors of diet, and psychical disturbances. (4) Rising on the 4th day, with longer continuance of the increase, generally over 14 days, then slow return to the normal—complications of the milder puerperal diseases, with disturbance of digestion, or slighter exudations in the neighbourhood of the uterus. (5) Rising on the 2nd, 3rd, 4th day, lasting from three to four days, then quick return to the normal—diphtheritic deposit on the mucous membrane of the genitals, and slighter endometritis. (6) Rising on the 6th to the 8th day, lasting two to six days, then rapid return to the normal—breaking up and removal of thrombi from the uterine sinuses, the general condition being almost undisturbed. (7) Early remarkable rising of temperature even in labour or the 1st or 2nd day, long continuance of the rise, without remissions—malignant diseases, ending either fatally or in tedious and exhausting convalescence, as endometritis, peritonitis, perimetritis, phlebitis, &c. ('Mon. f. Geburtsk.,' Dec. 1868).

Dr. Hémey made observations on 400 women as to the pulse in childbed. In 65 women out of 400 a retardation of the labour was verified down to 60 or fewer beats. The retardation mostly set in a few hours after labour, and then remained equal for some days. The greatest retardation was on the second day. The course of the labour, if natural, had little influence. Every pathological disturbance brings quickly a rise in the frequency of the pulse. In 27 cases of saccharine urine 15 gave a remarkable rise in the pulse; 92, 132, without other disturbance; 12 exhibited retardation. The milk-flow during the 2nd to 5th day of childbed caused, in 280 out of 400, no remarkable alteration of the pulse; sometimes it caused a slight interruption to the retardation, but scarcely ever when the secretion was rich and the breasts full. The retardation holds in premature as well as in mature births. After-pains had no influence. Emotions, however, and gastric disturbances soon cause acceleration; in like manner, but very transiently, changes of posture act. Retardation, then, must be regarded as a favorable symptom. What is the cause? From the diminution of tension consequent upon the rapid suspension of the circulation of the blood in the uterus after the expulsion of the child.

In 94 out of 400 cases irregularity and inequality of pulse were found. The irregularity recurred every two or three beats, was observed from the first to the tenth day. Milk-secretion, duration of labour, death of embryo, after-pains, had little influence; but emotions and gastric disorders, by raising the frequency of the pulse, diminished the regularity ('Archives Gén. de Médecine,' 1868).

Puerperal Diseases.

Acute fatty degeneration in puerperal women and new-born children. By C. Hecker.—The author was induced, by reflecting upon a case of

acute yellow atrophy of the liver which he had observed to study the connection of this disease with pregnancy more closely. He thinks he is now in a position to affirm that puerperal women are liable to a disease running rapidly, even suddenly, to death soon after labour, the symptoms being obscure, without jaundice or intestinal hæmorrhages, and only recognised as acute fatty degeneration on dissection, the basis of which was laid in pregnancy. There are similar phenomena in new-born children. He gives cases:—(1) Normal labour; child dead; profuse hæmorrhage after expulsion of placenta; sudden death an hour after labour. The child had probably been dead eight days. On dissection the brain was found anæmic, lungs somewhat œdematous; no trace of thrombosis in the pulmonary arteries; heart small, full, flaccid, containing hardly any blood; valves sound; tissue showing no change under microscope. Under the peritoneal coat of the liver were considerable blood effusions, so that the colour of the surface was deep red; the substance was brown red, volume somewhat increased. On section, the blood effusions could be traced along Glisson's capsule to the finer branches of the vena portæ, so that the parenchyma looked as if sprinkled. Under the microscope the liver-cells were seen infiltrated, the pigment nuclei increased, numerous white blood-corpuscles, free nuclei, and molecules. The kidneys were in the condition of so-called "turbid swelling," and in the fluid a crowd of nuclei was floating. There was submucous blood effusion in the renal pelvis, and small ecchymoses in the mucous membrane of the bladder. In another case a pluripara was delivered after a face presentation. Profuse hæmorrhage during expulsion of placenta. Death of mother forty-five hours after labour, under obscure symptoms. It was found that the liver was in advanced stage of parenchymatous inflammation, the liver-cells being much destroyed and infiltrated with fat.

As to the new-born children, Hecker calls attention to the memoirs on acute fatty degeneration of new-born domestic animals by Fürstenberg and Roloff, in 'Virchow's Archiv,' 1864-5. He relates the case of a child that died ninety hours after birth, in which the liver was found smaller than natural, was bright yellow, like a goose's liver, and showed the characters of acute liver atrophy; the parenchyma was completely destroyed, and under the microscope were seen fat-droplets and molecular detritus. The kidneys showed uric acid infarctus and a considerable epithelial degeneration ('Mon. f. Geb.,' 1867).

Referring to a previously reported case, Dr. Hecker relates the following:—A woman, æt. 32, had been delivered easily and without aid of a mature living child on the 13th July, was seized twenty-eight hours afterwards with shortness of breathing and died suddenly. The body was well nourished. When examined, twenty-three hours after death, there was no trace of decomposition, of œdema, or of jaundice; but in the skin of the abdominal wall were numerous ecchymoses, which might raise suspicion that there was acute fatty degeneration. In the thoracic cavity was a yellowish transudation in considerable quantity; the lungs were sound, somewhat œdematous, and spotted with numerous sub-pleural blood extravasations. The muscular structure of the heart was fragile, showing many ecchymoses under the endo-

cardium; valves sound; no embolia in the pulmonary arteries. The liver was very yellow, not shrunken, soft and fatty. The spleen was enlarged, rather hard, looking very fatty. The kidneys were plainly in the second stage of parenchymatous degeneration; the capsule very easily removable, parenchyma swollen, cortical substance yellow. The uterus was well developed, the entire mucous membrane could be easily scraped off by the knife when its fibres were bared; there was a considerable blood coagulum on the mucous membrane. In the cervix uteri all round it was an enormous fresh blood infiltration, without a trace of loss of continuity. The outer aspect of the perinæum showed a bluish colour, which answered to a colossal mass of extravasations in the entire mucous membrane of the rectum. There was no blood in the canal of the rectum. The small intestine was empty, its mucous membrane pale, but containing in the duodenum numerous blood effusions in the mucous membrane. Microscopic examination showed fatty degeneration very plainly in the heart, liver, and kidneys. The significance of this case, Hecker thinks, lies in the fact that its anatomical character shows an obvious transition step towards the peculiar acute yellow atrophy of the liver ('Mon. f. Geburtsk.,' Feb. 1868).

Case of suppression of urine, fatal on the thirteenth day. By Dr. John Miller.—A pluripara had mammary abscess. At the end of a fortnight from labour there was suppression of urine. Towards the end there was intense pain in the region of the kidneys. Intelligence unaffected. Little or no œdema. No convulsion. Serum drawn from a blister gave urea. Kidney exhibited numerous oil-globules. A thin section presented the appearance of stearosis, intermingled with that of inflammatory epithelial degeneration of the tubules. (The case appears to be analogous to acute atrophy of the liver.—R. B.) ('Edin. Med. Journ.,' June, 1867).

Dr. Hill relates ('Dub. Quart. Journ. of Med. Science,' 1868) a case of suppression of urine in a phthisical woman who died twelve days after delivery.

Dr. C. B. Brodie relates ('Brit. Med. Journ.,' 1868) a case in which the placenta adhered; vomiting and temporary arrest of biliary secretion followed. The stools were quite colourless; the urine was not high coloured, nor was the skin jaundiced. Recovery.

Thrombosis.

Mr. J. W. Curran relates ('Brit. Med. Journ.,' 1868) a case of fatal cardiac effusion occurring on the ninth day after parturition.

Dr. W. S. Playfair illustrates the subject of thrombosis in memoirs ('Lancet,' 1867; 'Obst. Trans.,' x). He narrates four cases. Under title "Cardiac Apnœa" is one which ended in recovery. Thirty hours after delivery the patient complained of great weakness. On the third day a sudden fright was followed by syncope, then by intense dyspnœa; pulse very feeble, respirations 40; lungs clear. Immediately over the site of the pulmonary arteries was a distinct, harsh, rasping murmur, confined to a very limited space. Heart sounds feeble and tumultuous.

The existence of coagulum in the right heart was clear. Dr. Playfair thinks the possibility of such a condition existing without proving fatal had not previously been suggested.

A fatal case of pulmonary thrombosis, probably caused by septicæmia, is related by Dr. W. Martyn (loc. cit.)

Phlegmasia dolens.

Dr. Bailly relates a case. Autopsy revealed general and suppurative peritonitis; a purulent collection in the pelvis behind the pubis; the principal veins of the left leg were completely obliterated by clots at the valvules; these clots were traced in continuity to the uterine branches of the hypogastric veins. Dr. Bailly deduces that phlegmasia dolens always proceeds from uterine phlebitis ('Bull. de la Soc. Anat. de Paris,' 1867).

Dr. Barnes exhibited ('Obst. Trans.,' x) the uterus and vessels concerned in phlegmasia dolens. The uterus was well contracted; the broad ligaments natural; the veins running in the right broad ligament were closed. The right iliac, femoral, and popliteal arteries were healthy; the right common iliac veins, as far as the cava, the external and iliac veins, were entirely closed and contracted. The femoral, popliteal, and upper part of the venæcomites were obstructed by coagula. The femoral vessels were matted together by adhesions. There was suppuration in the right hip-joint.

Nervous Disorders in Puerpery.

Dr. Wachs ('Mon. f. Geb.,' 1867) describes a case of *hemeralopia* following labour; recovery.

Mr. Curgenven ('Obst. Trans.,' ix) extols bromide of potassium in *puerperal mania*.

Dr. Hicks (loc. cit.) says in nearly all the cases he had seen the lochia were putrid.

Puerperal Convulsions.

Dr. D. W. Brichell discusses this subject ('Edinb. Med. Journ.,' 1868) with much care. He points out the distinction between it and epilepsy.

Dr. A. B. Steele ('Brit. Med. Journ.,' 1867) discusses the treatment and the indications for and against bleeding.

Dr. Casati ('Annali Univ. di Med.,' 1868) details five cases; in three, injections, hypodermic, of atropine, morphia, or quinine, were made; they did not arrest the fits. In one case albumen appeared in the urine after the fits, there being none before.

Dr. R. Dyce ('Brit. Med. Journ.,' 1868) relates eight cases.

Dr. J. G. Swayne (ibid.) discusses the value of the old plan of free bleeding. His experience is favorable to the practice. He describes one striking case in illustration and refers to others.

Dr. Weber relates ('Wien. Med. Presse,' 1867) his experiences of eclampsia during the reproductive period of women.

Dr. W. Lange relates the following:—A secundipara was admitted at the Heidelberg Clinique with œdema, albuminuria, commencing labour

and convulsions. Delivery was accelerated by forceps. The child was dead, macerated. The patient was bled, had ice to head, glyster, morphine injections, chloroform, cold douche to head. After 32 fits, being in the highest degree exhausted, in deep sopor, transfusion was resorted to. Blood defibrinated was used; seven ounces were injected. The pulse rose, breathing became freer, cyanosis disappeared; sleep followed. She recovered ('Prager Vrtljhrsch.,' 1868).

Dr. Cappie relates three cases of convulsions occurring near the natural term of gestation. He practised early delivery, dilating the cervix uteri with the finger, and applying the forceps before the dilatation was complete. He urges that this mode of delivering the patient as quickly as possible is the proper treatment to adopt. He found little or no service from bleeding or chloroform, and says the fits were not excited or increased in severity by the operative proceedings ('Edinb. Med. Journ.,' Oct. 1868). This is certainly contrary to the experience of others.

Puerperal Fever.

A case of puerperal fever, or puerperal pyæmia, after an abortion, is related by Dr. Snow Beck ('Obst. Trans.,' ix) to show that puerperal fever is the result of a previous condition of the uterine veins and sinuses, from incomplete contraction and the entrance of purulent fluids into the system.

Dr. Barnes (loc. cit.) exhibited the uterus of a woman who had died of puerperal fever; the uterus walls were thick and fairly contracted; there was no pus or putrilage in the sinuses.

In a discussion (loc. cit.) Dr. Playfair referred to the history of the lying-in ward of King's College Hospital; erysipelas prevailing in the general wards, the lying-in women had puerperal fever, and, although no doubt existed that this fever arose from the infected general wards, the disease in the women did not exhibit the character of erysipelas. Dr. Braxton Hicks, Tyler Smith, and Hall Davis, advocated the same opinions as Dr. Barnes.

The Professor and Director of the Maternity at Ferrara, in an interesting report of that institution, relates some cases of miliary fever which appeared to present an epidemic character. They occurred in the winter and spring of 1865-6. In the course of this epidemic there happened also a distinct case of ordinary puerperal fever. As the miliary fever is not now common in this country, it may be interesting to cite the description of the disease, as it occurred in the Ferrara Lying-in Hospital. A healthy woman had a healthy labour on the 31st January. She was seized with fever on the 5th day, beginning with a rigor similar to ague, and ending with copious sweating. On the 6th day the miliary eruption appeared; on the 9th there was dysuria. The fever reappeared on the 11th day, and fresh eruption attended it. The fever was renewed from day to day, with copious sweating and outbreak of miliary vesicles. After the 14th day the fever did not return, except on the 17th. A phlegmonous swelling in the mean time appeared on the right buttock, and turned to abscess, which was opened on the 24th

day of illness; pus and dead adipose cellular tissue were let out. She was quite well at the end of four weeks. The other cases ran a similar course; the chief features being repeated attacks of fever, ushered in with shivering; profuse sweating, and outbreak of miliary rash following, and a tendency to the formation of abscesses. The eruption consisted in small vesicles with a red base appearing on the chest, arms, abdomen, and thighs. The patients were treated with quinine and Dover's powder, and, it seemed, with good effect ('Annali Universali di Med., Milano,' 1868).

The experience of the Milan Lying-in Hospital is not such as to redeem the character of similar institutions in respect to the propagation of puerperal fever. Out of 478 labours, there were 23 cases of puerperal fever, 12 of metritis, and 20 of "miliary fever;" 13 ended fatally. This result is considered favorable, and credit is taken, and certainly due, to Prof. Lazzati, for the rigorous care he had exercised in isolating patients on the first appearance of illness, and in enforcing other hygienic measures. Owing to this care the hospital was preserved free from any epidemic during the first eleven months of the year. It is true that several sporadic cases occurred during the year, and that eight ended in death; but before December there was no spreading. In this month 12 cases occurred, of which 5 died. The rise of the epidemic is ascribed to the admission of a case, at the end of November, of a patient in labour, who had to be delivered by cephalotripsy. She was admitted in a state of extreme prostration, with tympanitis. Labour had been in action for 43 hours, and a dirty-brown fetid liquid was discharged from the vagina; the fœtus had been dead some time. She died 23 hours after the operation, with symptoms of puerperal fever. Suppurative peritonitis was found. The influence of the zymotic or hospital miasm is seen in the history of the diseases attending the prevalence of undoubted puerperal fever. Dr. Casati says puerperal fever represents the prototype of all the zymotic diseases of puerperæ; that is, metritis, not permanent, inflammatory, mostly accompanied by miliaria, essential miliary fever, phlebitis of the lower extremities, represent simply a minor severity of the evil, but depends upon the same zymotic cause. These affections are found to prevail simultaneously with puerperal fever. When puerperal fever breaks out these affections appear in the hospital. When the fever is driven out the affections described vanish. The same treatment had similar effects. The children born of women affected with puerperal fever, or these cognate diseases, were equally liable to sicken and die, or to be born dead ('Annali Universali di Medicina, Milano,' 1867).

There is an elaborate memoir on "Maternities," by Dr. Louth, of Strasbourg, in the 'Annales d'Hygiène,' &c., 1867. In it are fully discussed the conditions necessary for promoting puerperal fever. He recognises, with Lefort and most recent French authors, the sad fatality that seems inevitably and especially to attach to lying-in hospitals. No doubt, the logic of facts will in time lead to efforts to establish charitable institutions for domiciliary midwifery; and then the difficult problem how to construct and to administer a lying-in hospital with safety to the patients will be less imperative.

This subject is also discussed by Trélat, Le Fort, and Tarnier, in the 'Gazette des Hôpitaux,' 1866; also by D. Phelan ('Dublin Quar. Journ.,' Feb. 1867); also by D. L. Atthill (ibid.).

Dr. Boehr, recognising fully the doctrine that puerperal fever is propagated by infection carried by the touch, argues in favour of compulsory sanitary regulations to prevent it (memoir, 1868).

Observations on the contagion of puerperal fever through a midwife.—Dr. Kaufmann relates the following history:—In Durkheim, at a time when there was no other epidemic present, a man had diphtheritis, and was convalescent, when at the end of April a young primipara was delivered in his house. Two days afterwards she sickened with puerperal fever. She was attended by a midwife, M—. She died. Exsudation in the abdomen, and diphtheritic endometritis found. Within the last fortnight four other women were attacked, all of whom had been attended by the same midwife. During the month of May M— attended six women; five took the fever, and four died. During the same time two other midwives attended twenty-one cases, all without accident ('Mon. f. Geb.,' April, 1867).

Puerperal fever is discussed by Dr. G. Hewitt ('Obst. Trans.,' x) in connection with the history of the British Lying-in Hospital. He advocated early resort to the stimulant plan of treatment, and tincture of iron. Dr. Snow Beck disputed the reality of puerperal fever in Dr. Hewitt's cases. There is an elaborate critical historical survey of the whole subject by Dr. Ferber ('Schmidt's Jahrb.,' 1868).

Mr. R. Rowling ('Obst. Trans.,' x) related the history of the Florence Nightingale Ward at King's College Hospital. The mortality of the lying-in women had increased every year; the average was 1 in 28·9 cases. The department was consequently closed.

Scarlatina in childbed. Hervieux ('L'Union Médicale,' 1867) describes the eruption as appearing in twelve to twenty-four hours after the first symptoms; it lasts from four to six days; the desquamation is never so marked as in non-pregnant women; improvement attends desquamation; the most serious complications are metritis, peritonitis, uterine phlebitis.

IV. THE NEW-BORN INFANT.

On the urine of the fœtus and new-born child, especially on the influence of labour upon the quantity and composition of the urine. Prof. Dohrn.—The paper (a very interesting one) is based upon 100 cases, divided into three categories:—(1) Normal labours. (2) Cases in which disturbance of the fœtal circulation was made out during labour. (3) Dead-born children. The following are his conclusions:—(1) Most children whose births are normal come with urine in the bladder; the quantity, on an average, is 7·5 cubic centim. (2) The children of pluriparæ, oftener than of primiparæ, girls than boys, heavy than light, quickly born than slowly born, have urine in the bladder. (3) Oftener during labour the pressure of uterine contraction causes a partial or complete emptying of the bladder, and this is directly through interruptions of the placental circulation, not indirectly

through compression of the fœtal body. (4) After labours, in the course of which a disturbance of the fœtal circulation was observed, the child's bladder was generally empty; even a slight disturbance is enough to cause this evacuation, whilst the excess of meconium only takes place in considerable alteration of the placental circulation. (5) The urine of new-born children is distinguished by a pale colour and slight concentration; it has a specific gravity of 1000·8—1006; reaction acid; it generally contains no albumen; the chlorine fluctuates between 0·02—·03 per cent.; the urea is from 0·1—0·8 per cent.; a few cubic centim. suffice for the detection of urea. (6) In children whose birth was attended with disturbance of the circulation, and in dead-born children, the urine is more concentrated. The albumen found in the urine of dead-born children is to be considered as a post-mortem appearance ('Mon. f. Geb.,' 1867).

Dr. C. Hecker, having measured many fœtuses at different stages of development, draws the following conclusions:—The seat of the umbilicus is never lower than in the lower third of the space between symphysis pubis and the extremity of the xyphoid cartilage. It is so low as this only in the third month. From this time we find it gradually rise until the sixth or seventh month, from which time there is no remarkable change, the proportion of 1 to 1·6 being maintained ('Mon. f. Geb.,' 1868).

Monsters.

Cases are described by W. Ross ('Obst. Trans.,' ix); complete epispadia, Dr. Eastlake (loc. cit.); caudal appendage in place of lower extremities, Dr. Meadows (loc. cit.), by Drs. A. Hall, Heywood Smith; spina bifida, with talipes varus of both feet; H. M. Madge (loc. cit.), a case of twins growing together at the breast and abdomen, by Dr. Scherer ('Bayer. Aerztl. Intell. Bl.,' 1867).

On twisting and knot-formation of the navel-strings in twins, by Dr. P. Müller ('Scanzoni's Beiträge zür Gebertskunde,' 1868); a contribution to the study of lateral hermaphroditism, by O. V. Franque (ibid.); a malformation caused by amniotic bands, by Dr. Jensen ('Virchow's Archiv,' 1868). Dessant describes ('Gaz. d. Hôp.,' 1867) a *tumour in the perinæum* of a new-born child. John Taylor ('Brit. Med. Journ.,' 1867) observed a new-born infant with an *abscess* under the jaw—not syphilitic.

Asphyxia.

Dr. Löwenhardt prefaces that a number of examinations of dead children, in which fruitless attempts at resuscitation had been made, taught him that what prevented the access of air was the accumulation of mucus, blood, and other fluids in the larynx and air-tubes, the result of premature efforts to respire. He further calls attention to a sure sign of life; it is the existence of pulsation in the fœtal part of the umbilical cord, which may be discovered when every other sign of life is gone. To feel this pulsation in the umbilical vessels the insertion of the cord must be seized between finger and thumb rather

deeply, and in such a manner that the volar surface of the hand lies gently on the child's belly over the region of the liver. In no case, says Löwenhardt, in which this beat was not felt has the child recovered. He then describes his apparatus. It consists of a pump and a fine india-rubber tube ten inches long, with catheter openings at the end. This tube is inserted by the aid of a fine stilet into the trachea in the following way:—An assistant with thumb and finger presses the neck above the larynx, closing the œsophagus, whilst the operator depresses the tongue with his forefinger, and slips in the tube. This tube is then attached to the aspirating-pump, which is used to draw out the obstructing fluids; then air is gently introduced ('Mon. f. Geburtsk.' 1867).

Dr. C. Hecker relates a case in which asphyxia was caused by congenital struma. The thyroid gland was remarkably enlarged (ibid., 1868).

Löwenhardt describes ('Monschr. f. Geb.,' 1867) an apparatus for catheterizing the air-passages. The operation is also discussed by Billmann ('Bay. Aerztl. Intell. Bl.,' 1867), and eulogised.

Dr. Beneke relates the following:—A child delivered by turning, in eighth month, was born asphyxiated; its breathing and heart-beat had ceased about fifteen minutes. Five quarters of an ounce of well-defibrinated and warm blood were injected by a glass syringe into the vein of the umbilicus. Breathing and pulsation ensued, but the ill-developed child died in nine hours. No thrombi were found anywhere. The brain was anæmic ('Berlin Klin. Wchns.,' 1867).

Diseases of Embryo and New-born Child.

Hereditary convulsions, confined to the males of a family, occurring during infancy and at about the eighth month of intra-uterine life, J. Curgenvan ('Obst. Trans.,' ix). Case of imperforate anus, the child living ten weeks without relief from bowel, after two unsuccessful operations, same author (loc. cit.). Fœtal peritonitis, W. H. Hunt (loc. cit.).

Dr. J. Whitehead ('Brit. Med. Journ.,' 1867) describes several remarkable cases of convulsions of the fœtus in utero.

On hæmatoma of the dura mater, by B. Wagner ('Jahrb. f. Kinderk.,' 1868).

R. Virchow details ('Virchow's Archiv,' 1867) observations upon congenital encephalitis and myelitis, conditions which he thinks are not seldom causes of death in new-born infants. He finds a fatty metamorphosis of the cells of the central or white substances of the brain and cord. He takes this to be the result of inflammation. He has observed it chiefly in cases of syphilis and of the acute exanthemata, especially small-pox, affecting the mother. He suggests that encephalitis and myelitis may have an active influence in the production of infantile paralysis and jaundice.

Dr. Scharlau has gathered together all the scattered cases of *so-called congenital rickets*. He then discusses the conclusions to be drawn from them. He describes minutely two cases which had come under his own

observation, and the propositions he had made from the subjects ('Monatsschr. f. Geburtsk.,' Dec. 1867).

H. Bohn describes ('Jahrb. f. Kinderk.,' 1868) a peculiar form of congenital rickets, and discusses the pathology of rickets in children.

B. Wagner (ibid.) describes a case of congenital kyphosis and luxation of the left tibia.

Nævi.

Prof. Santesson ('Journ. f. Kinderkr.,' 1868) contributes a memoir on the danger of injecting Liquor Ferri Perchloridi into nævi and telengiectatic growths. He relates the following:—He saw a child, aged eight weeks, which had three vascular nævi; one was unimportant; two were situated, one on the left cheek, the other on the loin. The one on the cheek had grown quickly; its chief bulk was under the skin. Santesson used the tincture of oxymuriate of iron of the Swedish pharmacopœia. A syringe holding eight to ten drops of this was used. The needle-like point of the tube was first made to pierce the tumour in a vertical direction towards its centre. About half the contents of the tube was forced into the tissue, and the canula was withdrawn, and then in like manner another injection was made in a transverse direction. Whilst the piston of the syringe was being slowly pushed down, it was remarked that the child, who had hitherto been crying, suddenly left off, became pale, stretched himself forcibly under the operators, soon became cyanotic, and breathed slowly and feebly. Then convulsive twitchings followed. Death occurred in a few minutes.

Autopsy.—The nævus had shrunk; its spongy texture was changed into a firm substance by the coagulation of the blood. The neighbouring veins—the facial and its roots—were empty. The jugulars, external and internal, contained no clots in the upper part of the neck, but in the lower part, near the thoracic cavity, the blood was mostly coagulated. These clots becoming stronger and stronger downwards through the subclavian and vena cava inferior, reached into the right auricle, and even into the right ventricle of the heart, which was distended with clotted blood. The left auricle contained a small clot, the left ventricle was empty. The muscular tissue of the heart was firm and contracted. The lungs were much distended with blood. Elsewhere there was nothing remarkable.

Santesson observes that, to prevent the recurrence of such a catastrophe, compression ought to be kept up on the veins leading from the nævus during injection.

Diseases of Children.

"Pædiotrophy, Pædiopathy, and Pædiatrics," is the title of a statistical memoir on the morbility and mortality of infants, by J. B. Ullersperger ('Journ. f. Kinderk.,' 1867). He draws largely from the memoir of Dr. W. Farr, in the 'Journal of the Statistical Society,' 1866. He carefully discusses the causes of mortality, and the various modes of rearing infants, as by natural and artificial lactation and by infant foods.

Dr. F. J. Behrend (loc. cit.) discusses the school as a focus for the spread of contagious diseases.

The nutrition and care of infants is also carefully discussed in a series of aphorisms, by Dr. Hauner, in a report of the Munich Children's Hospital (loc. cit.).

Prof. Drachmann, of Copenhagen ('Journ. f. Kinderk.,' 1868) discusses the physical education of girls, and the hygiene of girls' schools.

The "Second Yearly Report of the Prague Foundling," by Dr. G. von Rittershaim, is an interesting account of the experience of that institution ('Prag. Viertelj. f. prakt. Heilkund,' 1868).

Dr. A. Brünniche gives ('Journ. f. Kinderk.,' 1868) a clinical report of the Children's Hospital at Copenhagen for 1866. Dr. Abelin (loc. cit.) gives a report of the Stockholm Children's Hospital for 1865. These reports are chiefly numerical.

Henoch ('Beiträge z. Kinderheilk.,' 1868) contributes observations on congenital syphilis. He observed six cases in the second year of life, which he regarded as *relapsing*. The first signs, having appeared in the earliest months, and having been incompletely healed, had reappeared after a more or less protracted interval. In several of these children signs of rickets had appeared. In three cases of older children the disease seemed with great probability to be traced to direct infection. A child, three years old, had condylomata on the arms and vulva, which had been known to be quite healthy three months before, and had been nursed by a woman who had been in hospital for syphilis. The other cases were similar.

The fact that syphilis may remain latent in the mother's system many years, and then suddenly declare itself on the birth of a syphilitic child, was proved in two cases. A mother of a child ten weeks old, obviously suffering from hereditary syphilis, and who had already borne three healthy children, and then had aborted three times, confessed that she had been infected by her husband in the first year of marriage. In another case the husband had an unhealed primary syphilis when he married. The first child, born a year afterwards, had repeatedly swellings on the tibiæ, and when seventeen years old had a considerable periostosis of the left humerus. The mother herself during twenty years of married life had repeated angina and swellings in the knees, cured by iodine. During this time she bore two quite healthy children, then aborted several times, until in the twentieth year she had a boy which, fourteen days after birth, showed marked symptoms of hereditary syphilis, which after a long time was overcome by mercury.

Dr. Huber contributes ('Deutsh. Arch. f. Klin. Med.,' 1868) observations on *disease of the suprarenal capsules in congenital syphilis*. This condition has been little noticed. Bärensprung says that after the liver and lungs the capsules were most affected. Huber relates a case of a syphilitic child that died when fourteen days old of diarrhœa and progressive algidity. The body was extremely emaciated. The lungs were expanded. In the lower lobes of one lung was a yellow thick knot, the size of a hemp-seed. The suprarenal capsules were large, greyish outside, translucent, thick, with numerous white, irregularly shaped spots interspersed in the capsular substance. At the posterior surface

of both capsules were irregular, yellow, thick knots, showing under the microscope fatty detritus.

On the mortality of infants; the prophylaxis of infantile syphilis; on lactation, and the institution of foundling hospitals in Italy. By Dr. Romolo Griffini ('Annali Univ. di Med. Milano,' 1868). An elaborate statistical memoir.

In reference to the transmissibility of syphilis from a nursling to the nurse, there is a critical analysis of a case in which an action was brought against the nursling's parents ('Journ. f. Kinderk.,' 1867).

Muscular contraction in connection with syphilis is illustrated by a case by Henoch. A boy, fourteen months old, had a contraction of the right arm at the elbow-joint, of the fingers of the right hand, and of the knee-joints. Standing, sitting, or grasping with the right hand, were impossible. The biceps brachii and the flexors of the leg were tensely stretched, and attempts to extend the limbs caused shrieks. The child had had epileptic convulsions when three weeks old, and the contractions had followed. All the signs of congenital syphilis coexisted. After mercurial treatment, continued for two or three months, the child regained the use of the arm, and could begin to run. Henoch says the syphilitic nature of the contractions in this case was indisputable. He rejects the idea that the contractions might be due to brain or spinal disease in infancy. He thinks the indurations and contractions of the sterno-cleido-mastoid muscles occasionally found in new-born children are not connected with syphilis. In one such case he thought the affection due to a hæmatoma caused by the laceration of some fibres of the muscle by the forceps during delivery.

Diseases of the Nervous System.

J. Bierbaum ('Journ. f. Kinderk.,' 1867-8) relates cases establishing the distinction between *meningitis simplex* and meningitis tuberculosa. The simple form begins unexpectedly in the most healthy child, quickly advances, with violent fever, persistent lethargy or coma, retarded respiration, vomiting, constipation, contracted pupils, soon reaching its climax. This course is not that of tubercular meningitis, but much rather that of pure inflammation of the pia mater easily and quickly running into fibrino-purulent exudations. His cases were treated successfully by leeching, calomel, and at a later period by quinine.

Under the title "Pachyleptomeningitis," Dr. C. Mettenheiner (loc. cit.) discusses the varieties of hydrocephalus. He relates a case and autopsy, in which the dura mater was found very thick, and, being incised, gave issue to a stream of greenish thick pus. The pus had collected in the arachnoid space in a defined sac.

The same subject is illustrated by cases by Hensch ('Beiträge zur Kinderheilk.,' 1868). He relates autopsies. The course of meningitis simplex is always much more rapid than that of the tubercular form. He relates a series of cases of chronic meningitis and another of tubercular meningitis.

In a memoir on *hemiplegia* Henoch (loc. cit.) who says he has made many autopsies of children affected with hemiplegia. In all cases tuber-

culosis of the brain was found to be the cause, showing the enormous preponderance of this condition over all other structural changes in the brain. He agrees with other authors as to the rarity of hæmorrhages in the brain in children.

The pathology of *tubercular meningitis* is discussed ('Edin. Med. Journ.,' 1867) by Dr. Charlton Bastian.

Dr. Bastian starts from the following conclusions, which for a long time represented the actual state of scientific opinion:—(1) That the meningeal granulations are of a tubercular nature. (2) That they are identical with the granulations of serous membranes. (3) That they are met with only in subjects whose other organs also contain tubercle. (4) That the disease known as "acute hydrocephalus" is a tubercular malady. The first of these has been rejected by a certain number of French pathologists, whilst, among other things, Dr. Bastian hopes to prove that the second is quite incorrect. He gives two reasons:—First, that the granulations of the pia mater are something altogether peculiar, having intimate relations with the arteries in this situation, and with certain perivascular sheaths which surround them, but which do not surround those of the other serous membranes; so that, whereas, in the pia mater the granulations are always immediately connected with the arteries, and, moreover, present histological peculiarities in the serous membranes, such as the pleura or peritoneum, they have been shown to have local aggregations of cells, mostly of a fibro-plastic nature, with an amorphous intercellular substance. Second, that the arachnoid cannot be considered as an ordinary serous membrane. Dr. Bastian then explains the nature of the hyaline layer of connective tissue found by Wedl, Rokitansky, and Sankey, in certain morbid states of the brain, and the perivascular canals described by Robin and His, and verified by Lockhart Clarke. Dr. Bastian says he has met with these perivascular sheaths universally surrounding the cerebral and spinal blood-vessels, and also most of those in the pia mater. These sheaths and the perivascular spaces are the seats of several distinct pathological changes. He then relates two cases. He concludes that his observations lend strong support to the doctrines of Virchow and other cellular pathologists, in opposition to those of the humoral pathologists. In every part where new matter existed there seems to have been evidence that this was derived by direct and continuous, though abnormal, processes of growth out of pre-existing elements. The granulations of the pia mater are almost invariably produced by a multiplication of epithelial nuclei within the perivascular sheaths, and so have a most intimate and essential relationship to the vessels; they are not to be considered, therefore, as the very types of tubercle-granulations, but rather as structures altogether *sui generis*. He concedes, however, that, because the disease is usually met with in individuals of an undoubtedly tubercular diathesis, and from the almost invariable presence of tubercle in other organs, it is right to keep the name tubercular meningitis as in every way most suitable. Should the opinion of Prof. His be correct, that the perivascular canals and the network of passages in the substance of the pia mater are really lymphatics, then this

disease might be regarded as an inflammation of the lymphatics of the brain and pia mater.

The same subject receives clinical illustrations from Henoch ('Beiträge,' 1868) under the head of hemiplegia.

Bouchut discusses ('Journ. f. Kindk.,' 1868) the occurrence of *thrombosis of the sinus of the dura mater* in connection with chronic diseases of children, and the delirium and convulsions with which these diseases terminate. He recals to mind how many chronic diseases terminate in convulsions. As a rule, these are the forerunners of death. Many children thus die in the course of cachexias attending lung-phthisis, simple chronic or tubercular enteritis, vertebral caries, white swellings of the joints, hooping-cough complicated with broncho-pneumonia, &c. It was long believed that the delirium and convulsions appearing at the end of such chronic diseases were simply the result of the impoverishment of the blood. Most physicians think that inanition and chlorosis are the consequence of the cachectic state, and that the cachexia is developed through the protracted disease of the infant organism. This is generally true, and Bouchut recognises the truth of Marshall Hall's explanation of hydrencephaloid. But there are cases, he says, in which the convulsions in question spring from a quite different cause. He refers especially to the thrombosis in the sinus of the dura mater, by which obstruction to the circulation in the brain is caused, producing a passive congestion of the brain. The following case is an instructive illustration:—A little girl had suffered for several months from hooping-cough. Broncho-pneumonia ensued; incomplete anæsthesia attended, quickly merging in a condition resembling asphyxia. Now convulsions, lasting four hours, set in, were repeated twice in the same day, and led to death. Autopsy revealed considerable brain-congestion, and a small quantity of serous effusion in the pia mater and under the arachnoid; besides this, old coagula were found in the sinus of the dura mater; of these thrombi, which were hard and colourless, one was fifteen centim. long; it extended along the lateral sinus, and reached to the inlet of the jugular vein. Another thrombus, harder and paler, lay in the upper longitudinal sinus, had grown to the walls, and completely obliterated it.

Another case in which thrombosis of the sinus occurred was that of a phthisical child, giving rise to delirium twelve days before death. The ophthalmoscope revealed a grey papilla, surrounded as if with œdema; the boundaries were not recognisable, and these were rather surmised from the punctures around which the veins radiated. The vessels were large and pale, and the very pale choroid, like the retina, looked as if covered with a fine white sand. The cause of the delirium was sought in the sinus of the dura mater and the associated atrophy. The accuracy of this diagnosis was confirmed by autopsy. Tubercles and cavities were found in the lungs. The longitudinal and transverse sinuses of the dura mater were completely closed by blood-plugs, of which some were old, whitish, firm, and more or less grown to the walls, whilst other blood-plugs were still fresh, blackish, and soft, and had clearly formed in the last moments of life. The brain and membranes were sound. On examination of the eyes there was seen,

through the retina, close around the papilla, a rosy areola beset with red puncta. After removing the retina it was easily seen that the vessels of the choroid were filled with blood. The inner layer of this membrane had quite vanished, a few cells only were seen, and these had degenerated into fat. The pigment-cells of the lamina were quite gone, or were atrophic. The sandy appearance seen before death by the ophthalmoscope was only an optical illusion, and plainly due to the want of pigment in the choroid. How does the thrombosis arise? The blood must be in a condition easy to coagulate. Thus a protracted stasis of the blood, and perhaps a bulging condition of certain veins, as of the sinus, favours coagulation. The only result of his latest clinical observations, Bouchut says, is that in cases where, after long chronic diseases, children die in convulsions, we must look for thrombi in the great veins of the brain.

Hemiplegia.—Henoch says that, of all the numerous cases of hemiplegia which he has seen in children, in those that came to post-mortem examination tuberculosis of the brain was found to be the cause, again establishing the enormous preponderance of this disease over all other forms of alteration of brain-structure in childhood. He considers the diagnosis of brain-tubercle to be established in most of those cases which remain obstinate after fair treatment. His own experience coincides with that of other authors as to the extreme rareness of hæmorrhage of the brain in young children, that is, of the so-called idiopathic or primary hæmorrhage, which for the most part depends upon disease of the small blood-vessels of the brain; for secondary hæmorrhages, capillary or even in foci, resulting from tubercle in the brain, purpura hæmorrhagica, or thrombosis, are more frequent. He relates three cases occurring in children aged one and a half, seven, and seven and a half years. All three were seized suddenly in the midst of undisturbed health with hemiplegia, which in two passed into pricking sensations and numbness of the affected hand and epileptic convulsions. The convulsive phenomena bore exclusively on that half of the face and body which on their cessation remained paralysed. In the child aged seven and a half years all convulsive symptom was wanting.

In every case of epileptiform convulsions which exclusively affect one half of the body one is justified in assuming a material cause in the opposite hemisphere of the brain.

Henoch gives several instances of latent tubercular mischief in the brain. One was that of a boy four years old, who had been in hospital four months with phthisis pulmonalis without showing a symptom of brain affection, and who ultimately sank within a few days of tubercular meningitis. Besides the usual appearances, there was found a tubercle the size of a pigeon's egg, sinking from the pia mater into the substance of the brain in the left anterior lobe; another mass, as large, was found, easily shelled out, on the outer surface of the right corpus striatum; and lastly a mass, soft, adhering lightly between the tentorium cerebelli and the middle portion of the cerebellum. The bronchial glands were cheesy; the right lung tuberculous in the highest degree, and the seat of numerous cavities. Discussing this and a case equally remarkable, Henoch observes that extensive degenerations, not only of

the peripheral layers, but also of the medullary substance and of one half of the cerebellum, may run their course without any disturbance of the motor or sensitive spheres. How can such contradictions be reconciled? It appears that the multiplicity of the brain and meningeal tubercles disposes much more to latency of the symptoms than does isolation, just as, for example, an isolated neuroma is almost always the cause of the most violent neuralgia, whilst cases in which thousands of neuromata appear simultaneously in different nerves run without any pain. The diagnosis of latent tubercle of the brain may be drawn from the following considerations. In children who, together with tubercular degeneration of the lymphatic glands and of the lungs, with symptoms of caries of the petrous bone, with or without facial paralysis, and in the course of a normally or abnormally running tubercular meningitis, die, tuberculosis in the brain or cerebellum may be assumed with great probability, even when it has not been revealed by the ordinary symptoms. The occurrence of secondary changes in the surrounding brain-substance, especially of hæmorrhages and softenings, is not rare. He relates a case of malacia in the neighbourhood of miliary nodules. A child, æt. 5, of tubercular family, had frequent headaches. After a severe headache she was seized suddenly in the night with an apoplectic attack, loss of consciousness, which disappeared in a few minutes, then hemiplegia of the left side, including the left facial nerve. Speech unaffected; pupils normal. Diagnosis.—Tubercles in the right brain, with extravasation in the neighbourhood. On the fourth day vomiting appeared suddenly, with great elevation of temperature. Later, convulsive phenomena appeared in back and nucha (opisthotonos), the muscles of the eye and extremities, especially in the left leg. Death. Autopsy.—Basilar meningitis; scanty granulations of the Sylvian fissure; much serum in the dilated ventricles; the central portions and the walls of the ventricle not softened. The outer and under part of the right thalamus opticus had run into a grey-red pulp, in which yellow nodules, the size of a pin's head, were plainly seen. Miliary tuberculosis of the lungs.

He relates another case of especial interest in which the disease was limited to the corpus quadrigeminum. A child, fifteen months old, had measles six months before, followed by cough and emaciation. The border of the liver stretched two fingers' breadth below the right ribs. Diagnosis.—General tuberculosis, with fatty degeneration of the liver. Suddenly an unusual fixity of the eyes was observed; both eyes were directed outwards; the movements of the bulbs upwards was impossible, the lateral movements not hindered; the pupils much enlarged and sluggish. A frequent snatching of the head backwards was observed. Afterwards vomiting appeared; then somnolence, paresis of the right arm, strong pulsation of the fontanelle, irregular pulse of 72, respiration 60, frequent changes of colour, indicated basilar meningitis. Next day the right arm and leg were paralysed, as well as the palpebral and labial branches of the facial nerve; convulsions set in, and advancing sopor ended in death. Autopsy.—Basilar meningitis; pia mater, also on the convexity, infiltrated with turbid serum; numerous granulations in the fossa Sylvii, several in the choroid plexus; the ventricle distended

with clear serum, the walls unaltered. In the left posterior corpus quadrigeminum was a round yellow tubercle the size of half a bean, without alteration of the neighbouring medullary substance. All the rest of the brain quite normal. Tuberculosis of the bronchial and mesenteric glands and spleen. Liver enlarged and fatty. Henoch says he knows of but one other example of isolated tubercle of the corpus quadrigeminum. It is related by Steffen.

Bouchut discusses ('l'Union,' 1867) the *treatment of essential paralysis.* He relies upon irritation of the skin, thinks little of electricity, but suggests resort to electrization by aid of acupuncture to stimulate nutrition of the muscles.

In this place may be cited the conclusions of the late Dr. Hillier ('Lectures on Diseases of Children,' 1868) on *motor paralysis.* This is caused by (1) an organic change in the muscles, as in inflammation of the muscles, and possibly in progressive muscular atrophy. (2) An organic change in the conductors of motor impulse, as of the nerves supplying muscles, part of the cord, or brain; either of these may be affected by inflammation, hæmorrhage, or degeneration. (3) An organic change in that part of the brain which is the organ of will; this and the preceding usually go together. (4) A morbid change in the blood, as in typhoid, scarlatina, rubeola, diphtheria, or anæmia. (5) By a reflex influence transmitted from afferent to efferent nerves, and thence to muscles, or from some part of the brain or cord which is the seat of irritation. (4) and (5) are often combined. This differs from cerebral paralysis in hemiplegia being rare, and in the absence of the muscular rigidity which attends cerebral paralysis. Reflex irritation generally causes movement in cerebral, but not in spinal, paralysis. Under galvanism in cerebral paralysis the muscles retain their contractility; in essential paralysis of the graver kinds this is soon wholly or partially lost.

Epilepsy.—Henoch ('Beiträge z. Kinderheilk.,' 1868), discussing the treatment of epilepsy, speaks doubtfully of the use of bromide of potassium. He has found it very uncertain. He gives his experience of compression of the carotids as a means of stopping the fits. Quoting Bland, who recommended it in cases of hyperæmia of the brain, Dezeimeris and Trousseau, who compressed the carotid in the convulsions of scarlatinal dropsy on that side on which the body was most severely attacked, he says he himself has obtained very varying results. It is difficult to get to the patient before the fit is either over or subsiding. But he has frequently used the compression during the height of the fit. Only twice has he found any success. In the remaining cases the convulsions went on uncontrolled, and in two children who had lain for hours in convulsions and sopor death followed. Of the two successful cases he relates the following one:—A boy, seven months old, hitherto healthy, with retarded cranial ossification, but without other mark of rickets, had repeated vomiting for twenty-four hours, and several green stools. Suddenly he was seized with a convulsive fit, lasting a quarter of an hour; the face was cyanotic; he foamed; consciousness was lost; the carotids beat violently 130 times a minute. Henoch compressed both arteries against the cricoid cartilage

with his thumbs to such a degree that only a feeble blood-stream was felt, which from the great strength of the arterial tension could only be done by considerable force. In a few seconds the convulsions abated, the child drew a deep sigh, the face became calm, the look clear, the twitchings of the muscles ceased, and the usual stage of sleep ensued. During the compression the face became red, and after the fit he found the great fontanelle, which before was pulsating strongly, much sunken and pulsating gently. On the same day a second but much lighter fit occurred, and in the next week several more, which alternated with spasmus glottidis. The child at three and a half years was intelligent and well developed. Henoch had no doubt that the compression cut short a fit at its greatest intensity, and asks how? Necessarily the quantity of blood carried into the head within a given time must be lessened. It is not possible to avoid pressure upon the jugulars; but no one, he thinks, will contend that the retention of the venous blood is the cause of the quick successful result. He thinks this experiment rather proves that hyperæmia of the cerebrum, as well as anæmia, may excite eclamptic fits. In cases of the latter kind compression of the carotids would naturally be useful.

Henoch (loc. cit.) has some interesting remarks on *partial convulsions*. Spasms appearing in single groups of muscles, to be rightly appreciated, require long observation. They are frequently the first symptoms of a slowly advancing central disease, which may ultimately break out in the form of epilepsy or of plainly characterised organic disease. In infancy, especially, isolated twitchings of an arm, returning at uncertain intervals, are not seldom the first indications of tubercle in the opposite half of the brain. Henoch has repeatedly seen such twitchings, complete consciousness persisting, return for months; and in two cases, the sterno-cleido-mastoideus muscle and the orbicularis palpebrarum of the same side being also affected, suddenly complete epileptic attacks and paralysis of the affected parts took place. In such cases the electrical stream, which is praised for partial convulsions, can have no good result.

Henoch observed *spasmus nutans* in two cases. The children were nine months old. One was rachitic, and had previously suffered from eclampsia and spasmus glottidis. In this case the nodding movements were not limited to the head, but involved the entire upper body, recurring in very frequent attacks several times daily, and were so strong that the head sometimes was almost bent to the knees. In the other case the nodding movements alternated with lateral movements of the head, sometimes to the right, sometimes to the left. They were weakest on awaking, strongest after the child was tired. Spasmodic rotations of the eyes were frequent in both cases. There were no other disorders of health, and dentition proceeded normally. In the second case the movements began some days after a fall upon the occiput. Tepid baths and oxide of zinc soon wrought a good effect. In the other case death occurred suddenly.

An undoubted case of *reflex partial convulsion* was the following:— A scrofulous child, seven years old, had spasm of the facial nerve of both sides. The twitchings continued during sleep. There was intense

conjunctival catarrh, with blepharadenitis, which had appeared several times before, and had always called forth this reflex spasm. It was cured by inunction with unguentum cinereum and opium on the temples and forehead. A violent prosopospasmus of the left side was also seen in a boy eight years old, in whom a central cloudiness had remained on the left cornea after keratitis.

The relations of *chorea* with rheumatism and heart disease in children are minutely discussed in clinical comparisons by H. Roger ('Arch. Gén. de Méd.,' 1867-8). He says there is an interdependence between the three conditions—"ils semblent s'appeler les uns les autres." He admits a cardiac chorea, but says the heart disease and the chorea may start together from the same cause, as is the case sometimes with rheumatism and carditis. His cases establish that the heart disease often persists after the cure of the chorea. He further shows that chorea may be a cause of heart disease.

Henoch ('Beiträge,' 1868) found heart complication and rheumatism in five cases out of fifteen. He found arsenic the most faithful remedy.

Henoch also relates four cases of "*chorea electrica*," a disease distinguished from ordinary chorea by the lightning-like character of the muscular tremors. The following is a report of a case condensed:—A boy, æt. 11, had had epileptiform convulsions when nine months old, which did not cease altogether until he was seven years old. Since then the boy showed, every four minutes, short, lightning-like tremors of the arms, head, and trunk. When naked the twitching of the individual muscles of the trunk and legs were plainly seen. The projected tongue showed the peculiar vermicular movement of the chorea, but speech was not affected, and the boy could write when not interrupted by a twitching. The affection ceased during sleep. The heart was normal. He improved, but was not cured under two months' use of arsenic.

Dr. Henoch ('Beiträge z. Kinderheilk.,' 1868) gives an interesting memoir on *spasmus glottidis*. It is based on 61 cases. In 46 of these he observed it was complicated with convulsions. The seat of irritation, he contends, is the root of the respiratory nerves—that is, in the medulla oblongata. Excitation may arise in a twofold manner—1. From bad nutrition of the nerve-substance. 2. From reflex irritation. Cold and catarrh of the air-passages are the most frequent sources of reflex irritation. Almost all Henoch's cases ended in recovery. He relates, however, two fatal cases. In one was found enormous congestion and softness of the cranial bones. Two points in the occiput were so soft as to be easily transfixed by the knife. There was much œdema of the pia mater, effusion of serum in the ventricles, venous stasis in the pia mater and sinus. Slight bronchial catarrh. No other morbid change. In the other case, which ended with epileptic fits, the cranial bones were very hyperæmic, thickened, and easily cut; there was enormous hyperæmia of the meninges and brain, and slight œdema of the pia mater. All other organs healthy. Henoch commends in treatment oxide of zinc, asafœtida and musk, but admits that the effect obtained is not great or lasting. Bromide of potassium was sometimes useful.

The Muscular System.

A case of *hypertrophy of the muscles* in a boy is related ('Journ. f. Kinderk.,' 1868) from the clinique of Dr. Bergeron, of Paris. At ten years old he measured 39 centimeters round the calf, but, nevertheless, he could only walk with difficulty. The case was investigated by Duchenne, who concluded that the hypertrophy affected the muscles, not the cellular tissue.

Duchenne publishes researches ('Arch. Gén. de Méd.,' 1868) on the pseudo-hypertrophic muscular paralysis or paralysis myo-sclerotica. It is characterised by weakness of motion in the legs and loins, extending gradually to the arms, and to the annihilation of movement; by increase of volume of some of the affected muscles; lastly, by excessive development (hyperplastic), with abundant production of a fibrous texture or of fat-globules in a more advanced stage. This disease Duchenne discovered in 1858. He relates 12 cases observed by himself, and cites 15 observed by others. The subject is carefully analysed and illustrated, and is worthy of special attention. The memoir is fully reproduced in the 'Journ. f. Kinderk.,' 1868.

The Air-passages.

Prof. Malmsten, of Stockholm, related to the Society of Swedish Physicians, 1867 ('Journ. f. Kinderk.,' 1869), a case of sudden death during pleurisy from *thrombosis in the pulmonary artery.* Apparently recovering from pleurisy, the patient went out, and on coming in was suddenly seized with great dyspnœa and severe palpitation. Respiration exceeded forty in the minute; the heart-beat was so strong that the chest-wall was shaken by it. On auscultation there was heard over the right lung a clear but very strong respiration-rush; over the left lung it was blowing. The patient became paler, the face and lips assumed a livid colour, a cold sweat broke out over the forehead, and in ten minutes death followed. The patient was conscious to the last moment. *Autopsy.*—The veins of the dura mater and pia mater were very full. On opening the chest the right lung collapsed normally. There were recent adhesions of the left lung below, and about two pounds of serum in the pleura compressed the upper part. No blood in the heart; the right, contracted, contained no trace of fibrin or coagulum. The heart was of normal size and structure. At the origin of the right pulmonary artery was a coagulum quite filling the vessel; it was dark coloured, and stretched into all the principal branches. There were no thrombi in the left pulmonary artery.

Dr. H. Fabius, of Amsterdam, discusses ('Nederl. Tijdschr. v. Geneesk.') the treatment of *croup*, estimating the worth of the various remedies employed. As an appendix is given the result of Prof. Titanus of Amsterdam's experience of tracheotomy. He practised this operation in eighty cases; twenty-eight were saved. It is not doubted that most of these twenty-eight would have died but for the operation, or that in many of those that died the operation was performed too late.

Dr. Müller, of Riga, discusses at length the more recent methods of

treating infantile *pneumonias* ('Journ. f. Kinderk.,' 1867). In lobar or croupous pneumonia he follows Ziemssen and Steffen. In the stage of hyperæmia Müller employs cold lotions. If the hyperæmia is great and the strength good he applies leeches. When hepatization has begun all bleeding is bad. Digitalis is most often useful. In the stage of resolution medicines are seldom called for. In catarrhal pneumonia Müller urges that, being generally secondary, the first care is prophylaxis. It is of the utmost importance to prevent accumulation of mucus in the air-passages. Hence Müller insists upon emetics, and upon ipecacuanha as the best.

Henoch (loc. cit.) discusses at length the question whether in every case the catarrhal form of pneumonia can be diagnosed from the croupous. He answers in the negative, and gives cases in illustration. Clinical as well as anatomical observation proves that between the well-characterised cases of croupous-lobar and of broncho-pneumonia there is an intermediate form which cannot be distinguished clinically. In the treatment of bronchitis and pneumonia Henoch insists upon the use of leeches, even in very young children, so long as the temperature of the skin is elevated and the state of the strength permits. He says he has too often been convinced of the good effect of leeches in the febrile condition not to avail himself of them in proper cases. Bad results, especially collapse, he has never seen where proper care has been taken. Of 30 cases of croupous pneumonia referred to in his memoir 6 ended fatally. But, says he, for the comfort of those of his colleagues who might accuse him of Vampyrism, none of these were treated with leeches. On the other hand, he relates several cases in which the beneficial action of leeches seems decided.

The other remedies consisted in infusion of ipecacuanha with nitrate of potash. If the fever were high, with great dyspnœa and extension of disease to the smaller bronchi, tartarized antimony was given, provided the intestinal canal was sound and the strength fair. In the croupous pneumonia he only used antimony when there was great bronchial catarrh, and then with infusion of digitalis and nitrate of potash. He speaks most favorably of the use of girdles wrung out in tepid water applied to the chest and neck.

Henoch (loc. cit.) in *catarrh and inflammation of the nasal mucous membrane*, whether syphilitic or not, extols as a local application the brushing with a solution of potassa. He describes cognate cases under the name *pseudo-croup*. This attacks children from nine months to seven years old. A child, either quite well or with a slight nasal catarrh, starts out of sleep, with anxious shriek and crying; the inspiration has the characteristic croupous clang. The play of the scaleni and alæ nasi bespeaks the difficulty of breathing. The fit soon subsides, and may be repeated next night, all that remains being the rough clang of the respiration, sometimes heard only during crying or strong inspiration. Almost always a nasal catarrh becomes developed, or even a slight tracheal catarrh. More rarely pain in the larynx and fever arise. Henoch believes this form of pseudo-croup has nothing to do with the larynx. The clear resonance of the cry, persistent in many cases, indicates the integrity of the cordæ vocales, whilst the croupous inspi-

ration appears to be caused by acute swelling of the ligumenta ary-epiglottidea and of the epiglottis, which may be rapidly developed from cold, just like the swelling of the nasal membrane.

Henoch (loc. cit.) confirms the observation of Virchow that the *cheesy change of the bronchial glands* met with in children is not always of tubercular nature. He says all the bronchial catarrhs which run a lingering course, whether primary or secondary, often entail a hyperplasia or swelling of the bronchial glands. In the course of a year a part of these cellular swellings either undergo a cheesy change or become calcified, conditions verified if the patients die of other diseases. The cases, therefore, of extensive caseous change of the bronchial glands in children, where the other organs are free, can only be regarded as the sequelæ of protracted or repeated catarrhs, and have nothing to do with tuberculosis.

Dr. Henoch's memoir on *pleurisy* is based on 54 cases. The inflammation affected in 27 cases the right and in 27 the left pleura. He never saw double pleurisy. Thirty-four recovered; in 15 the result was not known; in 5 death followed; in 3 there was previous tuberculosis; in 1 pericarditis complicated; in 1 convulsions set in. The prominent symptom of piercing pain in the side on breathing and coughing was seldom observed in little children. That pain existed there is no doubt, but the mode of expressing it is overlooked. Thus, Henoch says, the "fault of the so-called *latency* of pleurisy lies, in many cases, not so much with the disease as with the physician." Even in acute pleurisy the first development of the disease may be misinterpreted. It may be marked by cerebral symptoms. Out of the 54 cases Henoch saw epileptiform fits set in with the beginning of the pleurisy. Cough was altogether wanting in one case, and was slight in others. When it was troublesome he always found a complicating bronchial catarrh. The frequency of respiration was governed by the quantity of the exudation and the condition of the bronchi. In recent cases bronchial respiration was almost always recognised, less frequently throughout the entire range of the dulness, more frequently here and there with undecided respiration or with complete absence of respiratory rush in the most dull places. In chronic cases, with great effusion, all respiratory rush was frequently lost, but even here sometimes Henoch could detect a characteristic bronchial respiration. Careful dissection showed that the bronchial respiration was quite independent of pneumonia, and that it was simply due to lung compression by the fluid. Friction sound was repeatedly observed, but mostly at the stage of resorption. He thinks, however, its importance is exaggerated, and that fine mucous râle is often mistaken for it. Dislocation of the liver was observed five times in right-sided pleurisy. Vomiting repeatedly occurred in the first days of the disease. Fever was ushered in by rigor only in older children. Jaundice occurred in two cases; in one the pleurisy was right-sided, in the other left-sided. In both the jaundice was of the catarrhal character, with colourless stools and swelling of the liver, and ended without ill consequence. In two children a so-called *empyema necessitatis* was formed. In one the exudation filled the left pleura; a protracted hectic ensued, and emaciation proceeded

to an alarming degree. About seven weeks from the commencement a fluctuating prominence formed between the sixth and seventh ribs, and was opened with a bistoury. About a pound of completely purulent fluid was evacuated. This was repeated. The child quite recovered, but the fistula remained open two and a half years afterwards. In the other case, one of right-sided, also seven weeks from the commencement, a fluctuating projection was formed about the right mamma, and a week later a rupture occurred through the lung, and an enormous quantity of purulent masses was evacuated by the mouth. There was a circumscribed pneumothorax. The child recovered.

He relates a case interesting in etiology from the relation of the pleurisy to an eruption on the scalp. The child, nine months old, had suffered from birth from an eruption. It was admitted with eczema impetiginodes, with much foul-smelling discharge and swelling of the auricular and occipital glands. This was treated by poultices to remove the scabs, and white precipitate ointment. In a few days the eruption was nearly healed. On the other hand, shortness of breath and râle appeared, and complete right-sided pleurisy was developed. Diarrhœa set in. The eczema reappeared on the head, and the child got well. Henoch has little to add as to treatment of pleurisy. Bleeding was very seldom resorted to, the exudation being already extensive when the children came under observation. He generally gave infusion of digitalis and nitrate of potash, and later quinine.

There is an excellent description of the *lung diseases* of children in three lectures by Dr. G. Buchanan in the 'Lancet,' 1868.

Referring to the difficulty of diagnosing *phthisis*, he says that, of 203 cases, in 45 a certain diagnosis could not be made on a first examination; only 2 of the 203 had spat blood when they first came under observation. Flattening of the chest is only found in the rare cases where cavities are formed. The auscultatory signs are ambiguous. The most trustworthy is feebleness of respiratory murmur, with more or less coarseness of sound up to actual bronchial breathing. Prolonged expiration is seldom observed, but notable division of the inspiratory sound is more common. Percussion may be deceptive unless performed with great precautions. To get exactly comparable data, it ought to be performed on either side when the chest is equally expanded. But this condition is hard to obtain. Dr. Buchanan percusses each spot about which he wants information several times over through the different phases of inspiration and expiration, thus obtaining a complete average notion of the resonance and resistance of that spot before going on to another. In children under seven years he says the difference between the two apices is the reverse of that in the adult; the left side is commonly a little duller than the right. In an adult who has a tuberculous cavity the cracked-pot sound is very significant. In a young child it is worthless as evidence of cavity, for a perfect sound of this kind may be got by sharp percussion under the clavicle of many a healthy child if it should happen to be holding its mouth open. And, lastly, when percussion and auscultation have established the existence of consolidation in the apex of a lung, the nature of this is open to many interpretations; this arises particularly from the frequency of chronic and lobular pneu-

monia of the upper lobe in children. This difficulty is increased by the different course which lobar pneumonia of the upper lobe runs in children as compared with adults. The course is slow; the exudation is much more slowly deposited, and much more slowly removed. In the adult apex-pneumonia is almost constantly due to tubercle, but not so in children. The lung may quite clear itself. Of some diagnostic value is the presence of *tubercle in the bronchial glands*. These glands become the seat of deposit in five sixths of the cases of lung-tubercle. The local evidence is dulness at the first bone of the sternum, and a strongly marked snoring or blowing sound during expiration at the bifurcation of the trachea. In treatment of phthisis Dr. Buchanan thinks alkalies and salines act beneficially by improving the dyspeptic state. The citrate of potash he especially commends. If cod-liver oil and tonics are given before the digestion is attended to, mischief is often done. As to "climate," the results of Dr. Buchanan's researches are well known. These establish that in low-lying water-logged soils phthisis is far more fatal.

The Alimentary Canal.

In a series of clinical contributions Dr. J. Bierbaum ('Journ. f. Kinderk.,' 1868) describes an epidemic of *glossitis*. The disease was marked by local or partial swelling of the tongue at the onset, a pricking, burning pain, bright or dark red colour, increased salivation, thick unintelligible speech, dyspnœa, and swelling of the submaxillary glands. The febrile reaction was more frequently of erethetic than of synochal character. It ran an acute course.

Helminthiasis.—Bouchut, discussing the so-called "worm attacks" in children (ib., 1868), says the fact is not to be set aside. He relates cases. Against thread-worms he gives santonine; for a child two years old ten centigrammes for a dose, in honey or jelly.

Henoch ('Beiträge,' 1868) gives another example of the convection of ascarides from one patient to another. Ascarides, he says, cause little disturbance so long as they are confined to the small intestine; but when they get into the colon, colics, headache, faintings, and vomiting may occur.

Typhlitis stercoralis is the title of a memoir by J. Bierbaum ('Journ. f. Kinderk.,' 1868). It is, he insists, erroneously called typhlitis. He relates several cases. The physiological character of the disease is indicated by vomiting, obstinate constipation, colic pains, distension of the abdomen, and by a tumour forming in the right hypogastric region. The anatomical character consists in acute inflammation of the intestinal mucous membrane of the cæcum and ascending colon. The diagnosis is established by minute attention to the peculiarities of the disease, so as to exclude all other kinds of intestinal obstruction. The disease does not always remain simple, but peritonitis or inflammation of the cellular tissue uniting the ascending colon with the fascia lata is added. It occurs but rarely in any period of childhood, and scarcely ever in the earliest period. The etiology is still doubtful. It is very dangerous, owing to extension of inflammation and perforation of the abdominal wall. Early treatment may be successful. Purgatives,

clysters, local bleedings, and warm applications, are most to be trusted.

Dr. Müller discusses minutely ('Journ. f. Kinderk.,' 1868) the varieties of *diarrhœa* in children. First in the class of acute diarrhœa is the saburral diarrhœa of sucklings, the result generally of error of diet. He adds nothing but conjecture in explanation of the singular change of colour of the dejections from yellow to green after being exposed to the air. As to the choice of food, the selection of a nurse, he remarks that the microscope fails to distinguish milk that may be rendered poisonous by mental emotions. As a practical rule, he thinks it important to select milk the fat-globules of which are as uniform as possible in size, avoiding milk containing very large globules intermixed with others of various sizes. After much experience he concludes that pure cow's milk sweetened with milk-sugar, used directly after milking, is the best substitute for human milk. He insists that the cows should be fed on hay only. The milk should not be watered or boiled. To preserve it from decomposition, it is necessary to prevent its exposure to air, not only to avoid oxygen, but also the sporules of fungi. It should be tested by litmus-paper, and, if found ever so slightly acid, rejected. He calls attention to a *brochure* by Folger,—the artificial nourishment of infants with milk free from fungi (Münster, 1867)—who describes an apparatus which secures the milk from access of air, not only during its flow from the cow's udder, but also during the sucking of it from the bottle by the child. As to medicinal treatment, Müller speaks well of calomel in small doses for the first day or two. He then describes successively—2. The saburral diarrhœa of older children. 3. The catarrhal acute diarrhœa, including the summer epidemic, the diarrhœa of dentition, and the sporadic infantile cholera. On the subject of the last Müller discusses the various opinions held concerning its pathology. The gelatinous softening of the mucous membrane of the intestinal canal occasionally found he does not regard as essential; he admits that it may be the result of post-mortem digestion, and says that, from a clinical point of view, a pathological softening of the stomach can only be inferred when, after an extremely short illness, and after the most decided and violent stomach symptoms, death has followed. But such cases are extremely rare, and in most cases where softening has been found after death no symptoms had led us to suspect such a condition during life. In treatment Müller has found nitrate of silver, one eighth grain to one twenty-fourth grain, with sugar and gum, given four times daily, the most effectual remedy. As soon as symptoms of collapse begin, marked by paleness and a falling temperature, Müller has seen, in many cases, veratrum followed by recovery.

The chronic diarrhœas.—The common seat affected is the large intestine. They must be regarded as *chronic catarrh*, especially of the mucous membrane of the large intestine. Müller carefully discusses the treatment. In the form known as lienteria, in which there is such a condition of the intestinal canal that the food, quickly after ingestion, is expelled only superficially digested, Müller says nux vomica may be regarded as a specific, whilst opium is quite useless. In the common forms he recognises the value of nitrate of silver. He submits three

conditions as indicating the use of this remedy :—1. Croupous deposits in the mouth and fauces, such as frequently complicate chronic intestinal catarrh. 2. A peculiar redness and smoothness of the tongue. 3. Irrepressible thirst.

Dr. Henoch ('Beiträge,' &c., 1868) discusses the same forms of diarrhœa under the titles of *dyspepsia* and stomacal-intestinal catarrh. Setting aside the *vomitus neonatorum*, as scarcely a condition of disease, he says the vomiting associated with further disorders of digestion and nutrition, such as sour smell of the mouth and of the vomit, with anomalous stools, flatulence, and emaciation, in these cases there is a true dyspepsia, and sometimes change of food will be beneficial. But when this is useless the cause is to be sought in an anomaly of the gastric juice, or in a catarrhal affection of the mucous membrane of the stomach. Often the two conditions are combined, the first causing the second. Henoch has seen the best results from small doses of calomel, which may either act as an antifermentative or antiphlogistic. In some cases, where calomel fails, small doses of hydrochloric acid or of kreasote are very effectual. In others powdered calumba in one-grain doses was successful, the vomiting soon yielding.

The chief symptom of the intestinal form is diarrhœa, and the so-called diarrhœa ablactatorum presents the most striking example. The bad quality of the milk and other foods given leads to fermentation in the stomach and intestinal canal, attended by colics, flatulence, and especially sour-smelling green evacuations, containing small pieces of undigested coagulated casein. Vomiting may or may not attend. If the dyspeptic stools are neglected, the irritation causes, sooner or later, a catarrhal condition of the mucous membrane, marked by a copious admixture of mucus in the stools, and at last by streaks of blood. With the onset of catarrh, which mostly affects the colon, the aspect of the disease changes, the stools become more frequent and thinner, are squirted out of the anus forcibly, tenesmus and eversion of the intestinal mucous membrane following. Thirst, emaciation, sinking of the features, ensue. Here, again, Henoch advises calomel or hydrochloric acid, occasionally adding a drop of laudanum to the acid to allay the peristaltic irritability. In some cases, running a very rapid course, and resisting the above remedies, Henoch saw speedy improvement from the use of enemata of a solution of potash. The younger the child, and the more violent the course of the intestinal catarrh, the more quickly do cerebral symptoms arise. In a prognostic point of view, Henoch thinks the period of onset of the cerebral symptoms of great importance. The occurrence even of epileptic convulsions at the beginning of the intestinal affection is less to be feared than the first appearance of cerebral symptoms towards the end of the disease. In the latter case a fatal issue easily follows, whilst in the first the cerebral symptoms are commonly the result of simple reflex irritation. He relates a case in which the onset of the intestinal mischief was marked by epileptic convulsions, which stopped, and were not repeated, but brain-symptoms of another form—apathy, sopor, half-shut eyes—appeared later as the expression of continuous fever, sleeplessness, and inanition. The increasing weakness of the heart in these cases is due

to stasis in the venous system, especially in the sinuses of the brain, which, in conjunction with thickening of the blood to the point of thrombosis and its consequences, lead to hyperæmia and transudation within the cranium.

Zymotics.

Dr. Brünniche considers the identity of variola and varicella ('Biblioth. f. Laeger,' and 'Journ. f. Kinderk.,' 1868). After a minute critical analysis he concludes against the identity; that inoculation of one disease does not produce the other; that the appearance of varicella in the non-vaccinated does not annul the disposition for or susceptibility to vaccine.

Scarlatina.—Mr. Heckford, Surgeon to the East London Children's Hospital, an institution founded by him in 1867, describes ('Brit. Med. Journ.,' 1868) a peculiar form of scarlatina. There was little or no febrile disturbance; rash either absent or slight; at first no sore throat; but the submaxillary glands were almost invariably inflamed, the inflammation ending in suppuration or sloughing. In fatal cases a rash appeared over the trunk and extremities, resembling a purplish roseola. The mortality was very great.

Dr. Gran gives an interesting history of an epidemic of *membranous inflammation of the throat* (angina faucium exsudativa), which raged in Sontra from 1864 to 1866 ('Journ. f. Kinderk.,' 1868). The first case occurred in July, 1864, the last in July, 1866. Two hundred and seventeen cases were treated. A very limited epidemic of faucial diphtheria had occurred in the winter of 1862. The epidemic now described broke out suddenly. Gran ascribed it to the damp condition of the dwellings in the poorer and lower parts of the town, which six weeks before had been flooded to an extent unknown before. The houses had not got dry when the epidemic appeared. The house where the first child was taken was especially sodden, and in the worst condition. The epidemic assumed a contagious character from the beginning. It showed remissions raising hopes that it had ended, and then reappeared with greater severity. Weather had little influence. It attacked people living in all the streets of the town, and of all conditions. Cleanliness or dirtiness made no difference. Infancy and childhood were most exposed. The oldest person attacked was forty-four years. No infant under one year which had not begun teething was affected. The duration varied extremely, from one to fifty-five days. In most the disease ran its course in from four to seven days. The diphtheria was seldom complicated with other diseases; occasionally the membranous exsudation spread to the epiglottis. In these cases death invariably followed. During a part of the time there were many cases of scarlatina with inflammation of the fauces; but these cases were so different from those in question that Gran thinks they must be absolutely distinguished. The scarlatina epidemic lasted but a little while, and appeared in places where the peculiar diphtheria did not appear; it was never so rapid or so tedious in its course; it was never attended by the putrid smell from the fauces. Most of the patients attacked by the diphtheria had had scarlatina before. The chief symptom was the yellow-white, thin, or some-

times several lines thick exsudation extending from the gums to the pharynx, or only to a lesser portion of the fauces. One hundred and seventy-two cases recovered, forty-five died. Death occurred always from paralytic conditions, never from suffocation. As to treatment, it was observed that patients who could gargle did better than those in whom swabbing had to be trusted to. Children in whom not even swabbing could be used mostly perished; thus the greatest mortality was under five years. The most useful local treatment was chlorate of potash in a warm solution, with gum, as a gargle or applied by a brush. When gargling could not be practised, swabbing with nitrate of silver was most useful. Gran tried bromine in some severe cases, and thinks well of it; it destroys the foul odour. As internal medicine, Gran found a mixture of nitrate and carbonate of soda beneficial. In some cases, when there was constipation, he used sulphate of magnesia with advantage. The diet was sustaining. Ventilation was carefully attended to. Gran found warm air better than cold. He condemns blood-letting.

Dr. Michel Peter (ib., 1867) continues an elaborate clinical memoir on *secondary diphtheria.*

Dr. J. Ullersperger (ib., 1868) discusses the question as to the treatment of diphtheria by sulphur. It is mainly an abstract of the memoirs of Dr. Barbosa (' Gazeta Med. de Lisboa,' 1868), who had to deal with an epidemic affecting 2000 patients. The preparation used was the flour of sulphur, the method by local insufflation. It possesses a property of controlling plasticity. The success obtained by Barbosa calls for further inquiry. The action of the sulphur probably depends upon its power of destroying the disease-producing agent, the cryptogamic plants.

J. B. Rollo (loc. cit.) relates three cases treated successfully by the sulphur-insufflation.

Henoch (' Beiträge ') has given up relying upon chlorate of potash and cautery with potassa fusa. He recommends injections of lime-water, and quinine in hydrochloric acid.

Dr. Ullersperger relates experience in test of Trideau's method of treating diphtheria (' Journ. f. Kinderk.,' 1867). Trideau, a Spanish physician, had to encounter a murderous epidemic in Mayence, which killed about 200 persons. Other means failing, he came to the conviction that copaiva and cubebs were the most effectual remedies. He gave to adults half a spoonful of syrup of copaiva every two hours, then a gramme of cubebs alternately. The copaiva syrup is made of copaiva 80 grammes, gum-arabic 20, distilled water 50, essence of peppermint 16 drops, and common syrup 400 grammes. The cubeb syrup is made of cubebs 12 grammes, common syrup 240 grammes. Children take half the dose. If not tolerated, a drop or two of laudanum is added. Good nourishment is enjoined. Coffee is praised. More than 300 patients were subjected to this treatment, and "recovery always followed" when the treatment was begun during the first or second stage of the disease (' Gaz. des Hôp.,' 1867).

REPORT

ON

MEDICAL JURISPRUDENCE.

BY

THOMAS STEVENSON, M.D., M.R.C.P.,

LECTURER ON EXPERIMENTAL PHILOSOPHY AND DEMONSTRATOR OF PRACTICAL CHEMISTRY TO GUY'S HOSPITAL; EXAMINER IN FORENSIC MEDICINE IN THE UNIVERSITY OF LONDON; MEDICAL OFFICER OF HEALTH TO THE PARISH OF ST. PANCRAS.

Poisoning.

Drs. Crum Brown and Fraser* have published an elaborate paper "On the Connection between Chemical Constitution and Physiological Action; with special reference to the Physiological Action of the Salts of the Ammonium Bases derived from Strychnia, Brucia, Thebaia, Codeia, Morphia, and Nicotia." This paper we shall endeavour to epitomise.

Although it is obvious that there must exist a relation between the chemical constitution and the physiological action of a substance, as yet scarcely any attempts have been made to discover what this relation is. All that is known is that, as a rule, the compounds of certain elements and of certain radicles possess, when soluble, a physiological action which appears to be of the same kind for the whole series of compounds of each element or radicle. Since the *modus operandi* of poisons is almost unknown, and the chemical constitution of those poisons whose physiological action has been most carefully investigated is also but little known, small hope was held out of arriving at any law from such data. It appeared to these observers that there was more hope of arriving at some definite conclusion by studying the changes produced in the action of physiologically active substances by performing upon them certain well-defined chemical operations which introduce known changes into the constitution of these substances, but do not break up the molecule. Operations of this kind are (1) replacements, and (2) additions. For example, the operation indicated by these symbols, $Cu\,SO_4 + Zn = Zn\,SO_4 + Cu$, is a case of replacement, whilst the following is one of addition: $NH_3 + HCl = HN_4Cl$.

Replacement does not appear, as a rule, to produce any marked

* 'Trans. Roy. Soc. Edinb.,' xxv, p. 151; abstract in 'Journ. of Anat. and Phys.,' ii, p. 224.

change in physiological activity, except where the physical character of the substance is changed, or where the activity depends on direct local action, or where the replacement removes or introduces the element or radicle upon which the activity of the substance depends. The effects produced by addition are hence preferred in solving the proposed problem.

In order to discover the physiological effect of addition, we must compare the action of the substance before and after the addition is performed upon it; and that this may be done fairly, three conditions must be fulfilled — (1), that the two substances shall be equally absorbable; (2), that the process of addition can neither be performed nor reversed in the system; and (3) that neither substance has such a powerful local action as would prevent our observing its general or remote effect. These conditions exclude from consideration very many instances. Such a comparison may, however, be fairly made in a large number of cases, as for instance—

I.	II.	
Carbonic oxide, CO . .	O . .	Carbonic acid, CO_2.
Hydrocyanic acid, HCN .	H_4 . .	Methylamine, CNH_5.
Arsenious acid, $HAsO_2$.	$(CH_3)_2$.	Kakodylic acid, $AsC_2H_7O_2$.
Strychnia, $C_{21}H_{22}N_2O_2$.	$CH_3(HO)$.	Hydrate of methyl-strychnia, $C_{22}H_{26}N_2O_3$.

With strychnia a great number of alkaloids may be joined. It will be observed that all the substances in the first column are highly poisonous, whilst those in the third column, which are formed by the addition of the substances in the second column, are stated to be inert, or nearly so; their action, when they have any, being entirely different from that of the bodies from which they are derived. Such a connected view of these facts not unnaturally leads to a suspicion that *condensation*, by which is meant susceptibility of addition, is in some way connected with chemical activity, which seems also to be diminished, or removed, by chemical addition. This suspicion is strengthened when we observe that, in a very large proportion of the cases as yet investigated, saturated bodies (*i. e.* bodies whose condensation is 0) are inert, or nearly so. Kakodylic acid is a remarkable instance of this, and the salts of tetrethyl-arsonium seem to be equally inert. Similarly, the salts of tetramethyl-stibonium are not emetic. The occurrence, however, of saturated substances, such as alcohol, oxalic acid, and corrosive sublimate, having a well-marked poisonous action, and of condensed substances, such as benzoic acid and salicine, which are comparatively inert, shows that condensation is not the only condition of physiological activity; but there can be little doubt that if the effect of condensation were discovered and eliminated, the other conditions might be much more hopefully sought for. For these reasons, among others, Drs. Brown and Fraser turned their attention to the effect of chemical addition in modifying the action of poisons, and selected, as the first subject of investigation, the addition of iodide of methyl to the natural alkaloids belonging to the class of nitrile bases.

Certain other considerations led them to expect that, in the case of the natural alkaloids, the poisonous action would not be entirely re-

moved by this kind or addition; and experiments confirmed this surmise. Rabbits were the animals experimented upon.

Iodide of methyl-strychnium produced effects exactly the reverse of those produced by strychnia and its salts. There was not the slightest increase of reflex activity; and in place of violent spasmodic convulsions and muscular rigidity, the appearances were those of paralysis, with a perfectly flaccid condition of all the muscles. Death occurred from stoppage of the respiratory movements, and after death the heart was found acting with nearly its normal rapidity. The spinal motor nerves were paralysed, and, in place of the early or almost immediate occurrence of *rigor mortis* which follows the action of strychnia, the muscles continued flaccid, contractile, and alkaline, for several hours. The poisonous effect of strychnia, besides this alteration in kind, was found to be diminished at least 210 times; as much as thirty grains of the above salt have been introduced into the stomach of a rabbit without producing any effect, though twenty grains subcutaneously injected proved fatal.

Sulphate of methyl-strychnium, a more soluble salt than the iodide, is a much more active poison, though its effects are of a similar nature. These observers demonstrate that the above salts produce paralysis and death by destroying the functions of the motor nerve end-organs, and that their mode of action is, therefore, identical with curare, a substance which has been regarded as a counter-agent to strychnia, so opposite are the effects of the two poisons.

It is well known that brucia produces effects the same in kind as strychnia, but that the former alkaloid possesses only half the activity of the latter. The salts of methyl-brucium acted in a precisely similar manner to those of methyl-strychnium, and there was exactly the same diminution of activity, so that large doses had to be given in order to produce a fatal result.

Thebaia has been demonstrated by Claude Bernard to possess an action in all respects the same in character as strychnia and brucia, though a lower rank as a toxic and convulsant agent must be assigned it than to either of those alkaloids. The salts of methyl-thebaium act precisely as those of methyl-strychnium, methyl-brucium, and curare. Whilst thebaia is the first of the opium alkaloids in toxic activity, codeia is the second, possessing distinct convulsant and but feeble soporific properties. The salts of methyl-codeium do not possess the slightest convulsant action, but cause paralysis of the motor nerve end-organs. It is difficult to determine whether the feeble soporific action of codeia is affected by chemical addition, but Drs. Brown and Fraser are inclined to believe that it is not.

Morphia was the only other opium alkaloid in which the effects of chemical addition were examined. Bernard has shown that this substance is next in activity as a soporific to narceia, that it possesses a less convulsant action than codeia, and that its fatal dose is the largest of any of the active principles of opium. Sulphate of methyl-morphium caused paralysis in a rabbit without any trace of the convulsive action produced by morphia in that animal. The phenomena observed after the administration of the same salt to a frog proved that the peripheral terminations of the motor nerves were paralysed. It was ascertained

that soporific effects may be produced in man by the salts of methyl-morphium when given in very large doses.

The manner in which nicotia acts is not precisely known. It would appear, however, that the convulsive movements which always occur during nicotia-poisoning are not among the symptoms produced by either iodide or sulphate of methyl-nicotium. It was also found that this modification is not due to an action of the changed substance on the motor nerves, for it was ascertained that paralysis of neither the trunks nor end-organs of these nerves existed after the action of the above salts.

Drs. Brown and Fraser also examined the action of some of the iodides prepared by the addition of iodide of ethyl to the alkaloids, and found, as they expected, that it is the same as that of the corresponding methyl-compounds.

Some experiments were made to determine the physiological action of iodide of methyl. The only bearing of these on the present investigation is, that no evidence was obtained in support of the extremely improbable hypothesis that some of the changes produced in the action of the substances described might have been due to the addition of the physiological action of the methyl-compounds.

Concluding from these facts that when a nitrile base possesses a strychnia-like action, the salts of the corresponding ammonium bases have an action identical with that of curare, they remark that it is interesting to observe such a relationship, and that strychnia and curare are derived from plants belonging to the same genus. None of the alkaloids examined have, however, been converted into *curarina,* the active principle of curare, though the actions of the methyl-derivatives of these alkaloids are of precisely the same character as those of curare. The dose in case of the most active of the artificial alkaloids is considerably greater than that of curare, and much above that of curarina. Besides, curarina has a characteristic colour reaction that belongs to none of these bodies; and the latter further prove their dissimilarity by each of them possessing special colour reactions by which they may be distinguished from each other, the colour reactions of the alkaloids being retained by their methyl-derivatives. This may probably prove of importance to the medical jurist; and as these compounds are not precipitated by alkalies nor by alkaline carbonates, some difficulty may be met with in discovering their presence in cases of poisoning.

Though methyl-strychnia and its congeners require to be given in much larger doses than curare, yet the facility with which the former may be obtained in a state of purity and the greater certainty of their dose make them present many advantages in a therapeutical point of view. The action of morphia, also, is not a simple one. In addition to its chief action as a soporific, it exerts a stimulant effect on the spinal cord. The soluble salts of methyl-morphium have been shown to possess a narcotic, but no spinal stimulant action. It is, therefore, hoped that they will prove advantageous substitutes for morphia.

Cutaneous absorption of poisons.—M. Roussin* has been led by the observation of two cases of fatal poisoning in workers in Schweinfurt

* 'Ann. d'Hyg.,' xxviii, p. 179.

green (arsenio-acetate of copper), where other workers were unaffected, to investigate the conditions under which cutaneous absorption of poisons takes place. Having ascertained by experiments on himself that no absorption of iodide of potassium occurred when baths of this salt were used, if the precaution were taken of carefully wiping the surface of the body on coming out of the bath—that if on leaving the bath the adherent liquid were allowed to evaporate spontaneously on the surface of the body, absorption did take place—and that when the dry and finely powdered salt was dusted over the body absorption likewise occurred—he was led to infer that the condition which determines absorption is one of capillarity, the natural oily secretion of the skin preventing the absorption of aqueous solutions; whereas substances dissolved in fat, or capable of solution in it, are readily absorbed.

Excretion of poisons.—Dr. Lambe,* of Ulm, has made experiments on the excretion of poisons. He finds that ligature of the renal vessels has no influence upon the poisonous action of strychnia, but that if now artificial respiration be performed the spasms of strychnia-poisoning are suspended. He also confirms a previous statement,† that domestic fowls are almost unaffected by strychnia, and states that guinea-pigs tolerate a dose of this poison five times as great as that which rabbits of equal weight are able to bear.

Dr. W. H. Broadbent‡ attempts to apply chemical principles in explanation of the action of poisons. His paper, which has appeared only in abstract, is founded on these two postulates:—1. That there must be some relation between the substance administered and the animal organism on which the effects depend. 2. That, so far as the substance is concerned, the basis of the relation can only be its chemical properties, using the term in its widest sense. One of the most interesting of Dr. Broadbent's speculations is that relative to the poisonous action of prussic acid. He considers that prussic acid is carried by the blood to the nerve-centres; that under the influence of the affinities thus brought to bear upon the poison (affinities which normally determine the oxidation by which nerve-force is evolved), its elements are dislocated from each other, and the C and H, liberated in the latent condition appropriate the O destined for the evolution of nerve-force, which is thus arrested. He supports this hypothesis by the following facts:—When the elements of hydrocyanic acid are held together by some supporting affinity, as in ferrocyanogen, no poisonous effect is produced; artificial respiration, especially with oxygen, is the great means of neutralizing the effects of this poison; and it has been found by him that a proportion of prussic acid diffused in equal volumes of air and of oxygen respectively has a decidedly less powerful action on the animal in the latter case.

Dr. Broadbent's experiments are not yet completed, so we leave the consideration of many interesting points raised in his paper till we are in possession of full details.

Cadmium.—Marmé has investigated the toxic effects of the salts of

* 'Archiv f. Anat. Phys. u. Wissensch. Med.,' 1867, p. 629.

† Ibid., 1865, p. 602. ‡ 'Pr. Roy. Soc.,' xiv, p. 465.

this metal.* He finds that the sulphide is not poisonous, for it may be given with impunity to animals along with their food for a week; and the insolubility of the salt in water, oil, dilute acids and alkalies, renders its use as a pigment devoid of danger. Those compounds of cadmium which at the temperature of the body are soluble in water or in dilute acids, or are convertible into soluble salts, are all poisonous. The poisonous salts always produce considerable local irritation; when taken into the stomach in small doses they cause vomiting, and if in large doses, repeated evacuations upwards and downwards, also simple catarrhal and even ulcerative gastro-enteritis. The internal use of chloride of cadmium has produced perforation of the intestinal canal. The remote effects of the poisonous cadmium salts are those observed by Soret, viz. vertigo, vomiting and purging, cramps, slowness of the circulation and respiration, loss of strength, and unconsciousness. If such a fatal dose be injected subcutaneously, or into the blood-vessels, as will not cause death immediately, inflammation, and frequently hæmorrhage, erosion, and ulceration of the stomach and intestines, appear. For hounds, half a grain was found to be a fatal dose of the soluble salts when injected into the blood-vessels, whilst to destroy dogs weighing three or four pounds five to ten grains was required when the poison was introduced into the stomach; but as a portion of the salt was always rejected by vomiting, the fatal dose still remains undetermined. Alkaline carbonates with white of egg were found to be the best antidotes, and it was noticed that the early employment of dilute solutions of soda or soda-water arrested the poisonous action completely. The continued administration of small doses of the salts of cadmium causes disturbances of the digestive organs, emaciation, and death. On inspection of the body, gastro-enteritis, sub-pleural ecchymoses, partial congestions of the lungs, often fatty degeneration of the liver and of the muscular tissue of the heart, and diffuse inflammation of the kidneys, were found. The elimination of cadmium from the body commences very soon after ingestion, and occurs, with interruptions, chiefly through the kidneys. In order to detect cadmium in the fluids, Marmé† recommends, if the metal be present in not too sparing quantity, that a deposit be obtained by Reinsch's process. This bluish-grey deposit is to be dissolved in concentrated nitric acid, the solution precipitated with sulphuretted hydrogen, the precipitate freed from copper by means of cyanide of potassium, when the residue of sulphide of cadmium may be recognised by its colour and by its comportment with dilute acids and alkalies. In blood, urine, &c., where the metal is present in very minute quantities, it is best separated by electrolysis, a battery of four of Groves's cells being employed. From the stomach and its contents cadmium may be separated by dialysis.

Arsenic.—Dr. Kirchgässer, of Coblenz, has investigated poisoning by green wall pigments, and publishes 21 cases.‡ He inclines to the belief that the deleterious effects of the use of green wall pigments are due to the mechanical suspension of arsenical dust in the air of apart-

* 'Zeitschr. f. rat. Med.,' xxix, 1867.
† 'Zeitschr. f. Analyt. Chem.,' 1867, p. 298.
‡ 'Vierteljahrschr. f. gericht. u. offent. Med.,' ix, p. 96.

ments, rather than to the formation of a volatile arsenical compound, as some have supposed; and in the examination for arsenic of the dust deposited in rooms he insists on the necessity of decomposing the organic matter by means of strong sulphuric acid before introducing the solution into Marsh's apparatus. The symptoms produced are purely those of arsenical poisoning, and are not in any measure due to the copper also present in the pigment. They are those of alterations in the blood, and disturbance of the central nervous system. There is general ill-health, faintness, loss of appetite, depression, irregularity of the bowels, coldness of the extremities, restless sleep with unpleasant dreams, and the patient appears as if in consumption. The more characteristic symptoms are a discoloration of the skin, which becomes pale or of a yellowish clay-coloured hue, and then, in adults, brownish spots appear on the face, and more especially on the forehead, temples, and cheeks. Sometimes urticaria supervenes; and in one case, where there was a tendency to it, ecchymosis was observed. It is only in severe cases that the hair of the head is shed. Abnormalities of the nails were observed in one exceptional case. When there is much feverishness the deposits of fat in the body are absorbed, but where there is no pyrexia these deposits are left untouched, or there is even a tendency in the affected person to grow fat in parts, as is observed in arsenic eaters. Conjunctival catarrh and affections of the eyelids are often observed. The mucous membrane of the mouth is either pale or red and inflamed, and there is an increased flow of saliva, sometimes containing pus. Not unfrequently there is chronic inflammation of the throat, dryness, tickling, and hawking up of viscid or purulent sputa, which occasionally are streaked with blood. There may also be inflammation of the pharyngeal mucous membrane, and diphtheritic symptoms.

Pain in swallowing, heartburn, sense of weight at the stomach, eructation of odourless gases, nausea, and even vomiting, are observed. The appetite may be unaffected, diminished, or entirely lost. Colicky pains and loud rumblings are experienced in the intestines. The liver is of all the abdominal organs that which is most affected, and jaundice is sometimes observed; but this is slight. In one case the internal organs were found to have undergone fatty degeneration. The kidneys appear to undergo the same pathological change as the liver. Painful micturition is one of the characteristic symptoms of this form of poisoning, though it is not always present. The urine was examined for arsenic in eight cases, and the metal detected in six of them, whilst two yielded negative results. In one case arsenic was detected in the fæces eight weeks after the removal of the patient from the source of poisoning; and this is the more remarkable as none of the metal could be detected in the urine. The integrity of the male sexual apparatus is not affected, but that of the female is thrown into sympathetic irritation; but no tendency to abortion was noticed, and the children were born healthy. Beyond hoarseness and violent cough, which was most troublesome at night, no affection of the respiratory mucous membrane could with certainty be attributed to arsenic. But the wide-spread nervous symptoms are of the greatest interest. Irritability, loss of memory—especially for recent events—melancholy, and faintings, often of an in-

termittent character, were notable symptoms. Quiverings of the muscles, especially those of the hands, face, and tongue, were prominent. There was sometimes incomplete paralysis of the extremities, preferably the lower ones, but the muscles still retained their susceptibility to irritation by the electric current. The disturbances of sensation are usually slight, and consist of formication, numbness of the hands and feet, in some cases diminution of sensation of touch. The sight is unaffected, but the hearing is often impaired. Headache of the most varied situation and character is frequently troublesome. Sometimes so-called muscular rheumatism is present. In mild cases there is no pyrexia; but in severer cases, where more arsenic has been received into the body, there is fever, often of an intermittent type, though there may have been no exposure to malaria, speedy prostration of strength, and inflammation of different organs. During the influence of arsenic on the system the progress of syphilis appears not unfrequently to be in abeyance. Children are less susceptible to the chronic form of arsenical poisoning than adults.

In diagnosing chronic arsenical poisoning in dwellers in rooms covered with green papers, Dr. Kirchgässer relies upon the signs of alterations in the vital fluids: weakness out of all proportion to the local lesions, the cachectic appearance of the patient, and coldness of the extremities. If the sick person recover on change of air, and arsenical pigment be present on the walls of his dwelling, the diagnosis is strengthened. Greater reliance is placed upon a peculiar *set* of symptoms than upon any peculiar pathognomonic appearance, for there is no characteristic symptom of this form of poisoning. This set of symptoms consists of a brownish discoloration of the face, inflammation of the eyelids, disturbances of mobility, especially in the lower limbs, and a burning sensation during micturition. These are associated with intermittent symptoms and flying rheumatic pains. If arsenic be present in the pigment of the walls, and, above all, if it be detected in the fæces, the diognosis is confirmed.

M. A. Chevallier publishes a number of cases of arsenical poisoning, chiefly by arsenious acid, in which various antidotes were employed.* The hydrated peroxide of iron appears to have acted most successfully, even in severe cases; and this remedy would appear to be as efficacious when air-dried as when in the moist condition. Carbonate of iron acts like the peroxide, but the use of the latter is preferable. According to Mialhe, hydrate sulphide of iron is an excellent antidote, and is even better than the oxide. The ferric subacetate has been recommended by Duflos, the acetate being useless. Sulphuretted mineral waters are, perhaps, of use. Chevallier states that vegetable charcoal is valueless in cases of arsenical poisoning, and that animal charcoal is little better except it be washed. Magnesia suspended in water forms an insoluble compound with arsenious acid, and is a good antidote. Albumen, as is shown by Regnal's recent experiments, possesses no properties antidotal to arsenic.

Phosphorus.—The medico-legal history of this important mineral poison has of late received some extension, and cases of poisoning by

* 'Ann. d'Hyg.,' xxx, pp. 124, 423.

phosphorus have continued to attract much attention, both in this country and on the Continent. Drs. Habershon* and Hillier,† Profs. Tardieu and Roussin,‡ and Prof. Maschka,§ all publish cases of acute phosphorus-poisoning. Dr. Wittichen‖ gives an elaborate description of the acute and chronic forms of this kind of poisoning. Dr. Otto Schraube¶ reviews the whole question of the acute form of the disease; and, finally, MM. Eulenberg and Landois** write on the chemical antidotes of phosphorus.

In Maschka's four cases there was the usual postponement of serious symptoms. The post-mortem examinations showed a constant state of ecchymosis of the different organs, especially of the serous membranes and conjunctivæ, a fluid state of the blood, and a characteristic fatty degeneration of the stomach and kidneys. Fluidity of the blood and ecchymosis point to a general alteration of the circulatory fluid. The condition of the alimentary mucous membrane was not constant. Sometimes this exhibited signs of irritation and inflammation, varying from slight redness to ecchymosis, erosion, and effusion of blood. These appearances were so partially distributed as to lead to the supposition that their absence, presence, and distribution, were dependent upon the presence or absence of food in the alimentary canal protecting the mucous membrane from the irritating action of the poison. Maschka thinks that the jaundice which is almost invariably present a few days after the commencement of a case of acute poisoning by phosphorus is due at first to swelling of the mucous membrane of the duodenum, preventing the entrance of bile into the intestine, but that at a later stage the liver being unable to perform its function of secreting bile, the biliary constituents are retained in the blood.

In Tardieu and Roussin's case the patient, a child, of whom no history is given, exhibited extensive ulcerations of the stomach and small intestines — none of the large intestines. Phosphorus was here detected in small fragments, and in tolerably abundant quantity, in the ulcerated portions of the alimentary canal.

Schraube's paper is an exhaustive treatise on acute phosphorus poisoning, founded on 108 cases, 90 of which proved fatal within seven days. In these cases nausea and vomiting were almost constant symptoms, usually coming on soon after the administration of the poison, sometimes delayed for several hours. The ejected matters are frequently coffee coloured, but very rarely contain blood. Vomiting may cease after the first day, or may last throughout the whole course of the disease. A burning pain at the epigastrium was a pretty constant, though not an invariable symptom; and it may be overlooked, especially in severe cases. Thirst was seldom absent, and it was frequently unquenchable. Diarrhœa was not nearly so constant a symptom as has sometimes been represented, for it was met with in only one third of the cases where vomiting was present. Nothing peculiar was ordinarily observable in the stools; they contained blood seldom, still

* 'Medico-Chir. Trans.,' l, p. 87. † Ibid., p. 99.
‡ 'Ann. d'Hyg.,' xxix, p. 117. § 'Prager Vierteljahrschr.,' iv, p. 26.
‖ 'Deut. Ztschr. Staatsarznkd.,' xxv, p. 77.
¶ 'Schmidt's Jahrb.,' 136, p. 172. ** 'Aertz. Literaturblatt,' 1868, No. 12.

more rarely were phosphorescent. Diarrhœa may even be followed by constipation. Jaundice, which seldom comes on before the third day, is a pretty constant symptom; but as it is never very intense, it appears to have been usually overlooked in the earlier recorded cases. Hypertrophy of the liver was diagnosed in a few cases, but in only one case was it observed to be followed by atrophy. Attention has only recently been attracted to the spleen; but, where this has been examined, it and the liver have been found to increase in size simultaneously. The very slight degree of pyrexia present at times in the early stage appears to have been due to local action of the phosphorus. The rapidity of the pulse (130 to 140), in the later stage, is perhaps owing to fatty degeneration of the cardiac muscular tissue. Albumen is occasionally present in the urine, and biliary colouring matters usually. In experimenting upon dogs the bile acids have also been found in that secretion. No peculiar affection of the sensorium was ever noted, and this only becomes affected through general blood-poisoning. Disorders of the nerves of sensation and of motion, and of those of special sensation, were never absent, though no diagnostic indications could be drawn from them beyond lassitude and extreme weakness. Clonic spasms and general convulsions were sometimes observed. Excitement of the sexual organs seems to be induced only through diuresis and irritation of the urinary passages.

In noting the post-mortem appearances described by Schraube, we shall confine ourselves to those observations which appear to be novel. The jaundice was never confined to the skin, but extended to the sclerotic and to the serous membranes generally. It appears to be due to catarrh of the biliary ducts, is consequently obstructive, and caused by the reabsorption of bile. The signs of irritation and inflammation often found in the intestinal tract do not appear to be caused by local action of the poison, but rather to be due to its specific action, for Senftleben has produced the same internal appearances by the local application of phosphorized oil to wounds. The now well-known condition known as gastro-adenitis is then described, and a thickening or "cartilaginous" state of the gastro-intestinal mucous membrane. Fatty degeneration of the organs and tissues generally is next described minutely. General ecchymosis is pretty constantly met with, and appears to be merely an indication of general blood-poisoning.

Schraube is of opinion that phosphorus becomes oxidized in the body, and that the resultant acids may act as poisons; also that phosphorus may be absorbed unchanged, and afterwards being converted into phosphoretted hydrogen, this may act poisonously.

MM. Eulenberg and Guttmann recommend carbonate of copper and peroxide of hydrogen as antidotes for phosphorus. Conceiving that the toxic effects of this substance are due to its vaporization, and not to the acids generated by its oxidation, our object should be to prevent this vaporization, and consequent diffusion of the phosphorus. Carbonate of copper, being reduced by phosphorus, achieves this. Peroxide of hydrogen, which is now a common article of commerce, acts in a totally different and indeed antagonistic manner. Yielding up half its oxygen, it acts as a powerful oxidizer. The two antidotes must be

used separately, and not combined. There appears, however, to be no reason why the carbonate should not first be given, to prevent diffusion, and then the peroxide of hydrogen. The administration of the carbonate after the peroxide would be useless.

Hydrocyanic acid.—Dr. Frank * relates two cases of poisoning, one by essential oil of bitter almonds, the other by cyanide of potassium. In both cases large quantities of the respective poisons were taken for suicidal purposes. The post-mortem examinations were notable chiefly on account of the exhibition in both cases of appearances which, when observed previously, have been supposed to have had only an accidental connection with the administration of the poison. These peculiar appearances were a cherry-red colour of the very fluid blood, marked rigidity of the extremities, more speedy decomposition in the internal than in the external parts of the body, firm clenching of the jaws, great firmness of the medullary substance, exudation into the cerebral ventricles, distension of the vessels of the brain and spinal cord; above all, a distended state of the lungs, they being markedly filled with dark fluid blood, and penetrated with fine œdematous froth, such as is never found in other cases of sudden death.

Dr. Stevenson † has recorded a case of suicidal poisoning by hydrocyanic acid, observed by Dr. Hilton Fagge. The patient, a medical student, survived at least an hour and a quarter after the administration of the poison, and this is perhaps the longest time on record. Another remarkable circumstance was the entire absence of convulsions.

Preyer ‡ has investigated the cause of the poisonous properties of hydrocyanic acid and the cyanides. Directing his attention to the action of these agents on the colouring matter of blood (hæmoglobin) he finds that an aqueous solution of O-Hb § of such a state of concentration that the space between the absorption bands as seen in the spectroscope is quite clear, shows on the addition of cyanide of potassium and subsequent long standing, or if after the addition the temperature of the mixture be raised to that of the blood, in place of the two O-Hb bands, one broad ill-defined band, the darkest part of which lies somewhat nearer to the violet end of the spectrum than that of CO_2-Hb. Cyanide of potassium and O-Hb solutions are bright red when dilute, and almost black when concentrated; on the addition of water they exhibit a clear yellow glimmer, and they absorb the blue rays powerfully, and the violet completely. Such solutions will remain unchanged for a week, and are neither coagulated nor changed in their spectroscopic peculiarities on warming. Solutions of hæmoglobin, to which prussic acid has been added, behave in a similar manner, except that they are coagulated by a heat of 104° Fahr., and quickly become turbid at ordinary temperatures.

Into the minute spectroscopic appearances and changes produced by

* 'Horn's Vierteljahrschr.,' ix, p. 179.

† 'Guy's Hosp. Rep.,' 1868, p. 259.

‡ 'Arch. f. Path. Anat.,' xl, p. 125.

§ We here, and subsequently, employ a very convenient and now much-used notation, in which hæmoglobin is designated by the symbol Hb, its oxygen combination by O-Hb, its combination with carbonic acid by CO_2-Hb, &c.

chemical and other agents in solutions of the various modifications of hæmoglobin with hydrocyanic acid and the cyanides we shall not enter. The results obtained show that, at the temperature of the blood, these poisons unite with O-Hb and with CO_2-Hb, and that atmospheric oxygen is inadequate to reconvert the compounds produced into O-Hb. The compounds of O-Hb with HCy and with KCy respectively were obtained in the crystalline form, but their presence could not be detected in the blood of animals poisoned by HCy; so that the toxic activity of this substance cannot be accounted for by simply supposing rapid combination between it and hæmoglobin, and consequent destruction of the ozonizing capacity of the blood-corpuscles. Preyer, indeed, concludes from his own experiments on warm- and cold-blooded animals that asphyxia is the immediate cause of death. In warm-blooded animals there is also invariably paralysis of the heart, but this appears to be secondary to paralysis of respiration.

With regard to the blood, Preyer states that in warm-blooded animals poisoned by HCy it has a dark appearance, and never smells of the poison. It exhibits almost invariably the band of Hb only, very occasionally and feebly those of O-Hb, and reacts with O and with reducing agents like the blood in asphyxia.

Aqueous solutions of crystallized HCy-Hb caused the death of guinea-pigs and frogs, with symptoms of prussic-acid poisoning. The symptoms, however, set in later than with HCy alone; and this circumstance, coupled with the fact that the animals themselves smelt of prussic acid, whilst the compound itself has no such odour, leads to the supposition that not the compound is the active agent in prussic-acid poisoning, but the acid itself.

Great analogy is shown by Preyer's experiments between poisoning by hydrocyanic acid and by sulphuretted hydrogen; yet there are differences in the fatal dose, in the respective rapidities with which the poisons act, and in the circumstance that the latter poison does not act upon the heart through the vagus, as does the former. Animals poisoned by prussic acid can with difficulty be saved by artificial respiration, if the heart has not already ceased to beat. Since this restoration often only reaches a certain stage, and is then followed by death, Preyer considers it advisable to warm the air used in artificial respiration.

Nitro-glycerine.—Dr. Honert* reports a case of poisoning by this substance; the second, he states, that has occurred. A man took a tablespoonful of gunpowder for a boil, and in order to increase the effect of the remedy, added "a few drops" of nitro-glycerine. Soon afterwards he was seized with great nausea and violent and repeated vomiting. According to the patient's account, he became black about the eyes, had extreme headache and dizziness, and several times became unconscious. Great excitement was set up, especially in the vascular system, so that the perspiration rolled in streams from his head and limbs. After some time he became paralysed. When Dr. Honert first saw the patient, four hours after the administration of the poison, the whole of the voluntary muscles were paralysed, except the muscles of the face

* 'Deut. Klin.,' 1867, p. 83.

and eyes, where the paralysis was incomplete. The movements of deglutition were very laboured, the contractions of the heart and diaphragm much retarded, and this appeared to be the case also with the intestines, since stimulating enemata acted very slowly. Four hours after taking the poison the pulse was 39, full and hard. The respiration was in proportion to the cardiac contractions. A marked mucous rattle was heard in the throat. When the paralysis had reached its climax, the breathing became stertorous and the extremities icy cold. Twenty hours after swallowing the nitro-glycerine the pulse was 70; it then rose to 90, and the paralysis had almost completely disappeared. Gastric catarrh followed, but the patient recovered in a few days.

Dr. Werber,* in view of the importance which nitro-glycerine is assuming as a toxic agent, has devised means for its detection. Nitro-glycerine can readily be extracted from animals poisoned by it and from organic mixtures by shaking these with ether, chloroform, or benzol; and as the poison appears to resist decomposition, and the tests for it are of extreme delicacy, its presence is not likely to be overlooked. Two tests are proposed—the one dependent on the fact that several nitro-compounds (nitro-glycerine, pyroxylene, nitro-mannite, and nitro-amylene) yield a beautiful red coloration when treated with aniline and concentrated sulphuric acid, whilst other nitro-compounds (nitro-benzol, nitro-glycyrrhizine) do not yield a red colour under the same circumstances; the other grounded on a reaction with brucia. A red colour is produced when nitro-glycerine is treated with brucia and concentrated sulphuric acid. In order to apply the first test some of the ethereal solution of nitro-glycerine is mixed in a watch-glass with 2 or 3 drops of aniline, and the whole evaporated on a water-bath till oily streaks of aniline are left; a drop of sulphuric acid is then added to bring out the red colour. Or, the ethereal solution is evaporated till the nitro-glycerine is left as an oily drop; a drop of aniline is then added, and, finally, sulphuric acid. The second method is preferable, though it is less delicate. By the first method 1-1000th grain of the poison may be detected. The brucia test is applied in a similar manner.

E. Nyström† also contributes an important paper on the toxicology of this very interesting body. He points out the great danger involved in the extensive use of such a poison—sweet, colourless, and apparently so innocent. Already three deaths have occurred in Sweden from its administration. Nitro-glycerine, which is not sensibly hydroscopic, dissolves in water to the extent of $\frac{1}{4}$ per cent., and this solution is highly poisonous to frogs. Ether extracts the whole of the oil from its aqueous solution on shaking. Nitro-glycerine or its aqueous solution (the most poisonous preparation), applied to the unbroken skin, or given by the mouth, causes tetanus in frogs, gradually passing into paralysis and death. The great susceptibility of these animals to tetanus renders them extremely valuable in toxicological search for nitro-glycerine. Glycerine itself has no action on them. Birds are very insusceptible to the action of nitro-glycerine, and a guinea-pig took six

* Op. cit., p. 365.

† 'Upsala Läkareföremings Förhandlingar,' ii, p. 232; and 'Schmidt's Jahrb.,' 136, p. 164.

drops without exhibiting marked symptoms of poisoning. Nyström himself took a little more than the size of a pin's-head of the poison. He perceived immediately a sweet taste, then an uncomfortable sense of irritation in the throat; and, after five minutes, headache, painful throbbing in the temples, and contraction of the masseter muscles, symptoms which disappeared in the course of an hour.

The first case in Sweden of poisoning by nitro-glycerine was that of a girl, 13 years of age, who died in 1864, after drinking the poison from a flask. The second was that of a railway workman who drank a considerable quantity of the oil from a flask in mistake for beer. An hour later he was blue in the face and insensible. When admitted into the hospital he was delirious and insensible, and speedily become comatose. The hands were frequently raised to the head. The face was red and swollen. There was dyspnœa, and loud mucous râles were heard over the whole of the chest. Death ensued six hours after swallowing the poison. On examination the brain and its membranes were found to be congested, and there was some yellow serous fluid in the ventricles. The lungs were œdematous; and these, as well as the brain, were firmer than usual. The trachea was hyperæmic, as were also the stomach and the kidneys. There were numerous small ecchymoses about the fundus and cardiac end of the stomach. Signs of irritation were visible in the small intestines. A sweet odour was perceptible when the abdomen was opened. The third case was that of a peasant who drank twelve Swedish "ort"* of the poison in mistake for brandy, and died in two hours.

That considerable quantities of nitro-glycerine are required to produce a fatal result appears from a case where a carpenter drank a considerable but undetermined quantity of the poison. He suffered severely, but recovered.

Nyström compares (though, according to Huseman, not quite correctly) the effects of nitro-glycerine with those of nitro-benzol, and advances the opinion that they act by means of the same product of decomposition, and that, perhaps, this is hydrocyanic acid, which Dr. Gladstone has shown to be, along with oxalic acid, one of the products of the decomposition of nitro-glycerine in sunlight.

The author of the memoir shows that before applying the tests for nitro-glycerine the presence of nitrates must be excluded, since they yield the same reactions with the tests employed, as does nitro-glycerine itself. He recommends the contents of the stomach, or other fluid mixtures, to be shaken with ether, and the ether to be decanted, evaporated, and the residue dissolved in methyl-alcohol. The solution is then to be filtered, the filtrate evaporated, and the residue tested by its action on frogs, its explosive properties (best tried in capillary glass tubes), and by the tests previously mentioned.

Bundu—Akazga.—MM. Pecholier and Saintpierre † have experimented upon bundu, the ordeal poison of the Gaboon; and Dr. Fraser‡ has investigated akazga, a West African ordeal poison. Both are, doubtless, the same substance. Bundu comes from an apocynaceous

* I have been unable to ascertain the English equivalent of this measure.—Ed.

† 'Schmidt's Jahrb.,' 134, p. 20. ‡ 'Med.-Ch. Rev.,' xl, p. 210.

plant, growing in marshy places to the height of 6 to 10 feet. Fallot describes it as producing injection of the eyes, convulsive twitchings of the muscles, delirium, incoherent speech, and stupor like that produced by alcohol. Sometimes there is a copious secretion of urine, followed by recovery. MM. Pecholier and Saintpierre employed a cold infusion, a decoction, and a tincture of the bark of the root. These all contained the active principle of the plant in a form soluble in water and in alcohol. It is very similar to strychnia. Administered by the mouth, as well as epidermically, the various preparations caused at first a considerable increase, and then a decrease, in the rapidity of the respiration and circulation, sometimes increased sensibility, tetanic spasms, and lastly insensibility, paralysis, and death. Bundu acts on the motor nerves only secondarily, and is not a cardiac poison, since the heart continues to beat after death.

Akazga, described by Du Chaillu, is thought by Dr. Fraser to be extracted from a plant of the order Loganiaceæ, and probably from an undescribed species of the genus *strychnos*. The person undergoing the ordeal is compelled to drink an infusion of the plant. From an alcoholic extract Dr. Fraser has obtained an alkaloid, to which he assigns the name *akazgia*. This is a colourless substance, which, crystallizing with difficulty, is soluble in alcohol, ether, chloroform, benzol, and bisulphide of carbon; but is almost insoluble in water. Its solutions possess alkaline reactions and neutralize acids. Its salts are freely soluble in water, and have a very bitter taste. The bitterness of akazgia is, however, very different from that of strychnia, both in intensity and persistence. The alkaloid is precipitated by most of the general reagents for the vegetable alkaloids; but these precipitates are invariably amorphous. It affords the same colour reaction as strychnia. No formula has as yet been assigned to akazgia. Its physiological effects are precisely those of strychnia. We have, therefore, now four alkaloids closely allied in their botanical origin and in their physiological effects—strychnia, brucia, igasuria, and akazgia.

Curare.—Preyer* has isolated the active principle of this poison, and demonstrated that it is quite distinct from strychnia and brucia; and Dragendorff,† having subsequently prepared the alkaloid, confirms Preyer's statement. Preyer states that the modes of death from curare and from its alkaloid, *curara* or *curarina*, are identical, and result from abstraction of oxygen, strange as this may seem when the external signs of asphyxia—dyspnœa and convulsions—are absent. But this apparent anomaly is readily explained when it is known that all the respiratory movements are annihilated by the poison through paralysis of the muscles of respiration; and thus, if the heart beat vigorously, death from asphyxia must necessarily result. It will be remembered, as bearing upon this point, that great discrepancy of opinion is held as to the effect of curare on the inhibitory influence of the pneumogastric nerve on the heart.‡ Experiments on animals poisoned by this substance

* 'Berl. Klin. Wochenschr.,' 1867, p. 463.
† 'Russ. Zeitschr. Pharm.,' v, p. 153; 'Zeitschr. Chem.,' 1867, p. 28.
‡ *Vide* Retrospect for 1865-6, p. 17.

show that the blood is destitute of free oxygen, that both the venous and arterial fluid are as dark as in carbonic acid poisoning or after strangulation, and that blood taken from either the right or left side of the heart exhibits in the spectroscope only the bands of blood destitute of free oxygen. On shaking the fluid with air the bright red arterial colour returns, and also the bands of blood containing free oxygen. As no permanent pathological change is produced by curarina, complete recovery from its effects may occur under artificial respiration.

L. Hermann* thinks that the immunity from the effects of curare, when it is introduced into the stomach, results, not as is generally supposed from non-absorption of the poison by the mucous membrane of the alimentary canal, but from the fact that curare is so quickly removed by the kidneys that no sufficient quantity can accumulate in the blood to produce deleterious effects. Having tied the renal vessels of a rabbit, he introduced curare into the stomach, and found that death ensued with as much certainty, though not with the same rapidity, as when the poison was placed beneath the skin. Hermann also accounts for the inocuity of the venom of serpents, and of potassium salts, when introduced into the stomach, though both these are poisonous when injected into the blood, in a similar manner. He supposes that the removal of curare from the system, in birds, must take place slowly, since their urine is semi-fluid; and in accordance with this supposition is the fact that small doses of the poison, when swallowed, are fatal to these animals. As a practical conclusion, Hermann points out the importance of paying attention to the state of the excretory organs when active poisons are being administered therapeutically.

MM. Voisin and Louiville† give the following reactions for curarina:—The alkaloid gives a deep blue coloration with concentrated sulphuric acid, and with nitric acid a purple colour. With sulphuric acid and bichromate of potash a reaction is produced like that given by the same reagents with strychnia. Sulphate of manganese strikes a violet colour with curarina.

Calabar bean.—The action of this very active poison has been investigated in this country by Dr. Thomas Fraser,‡ and on the Continent by Bezold and Goetz,§ and the investigations of these latter experimenters have been continued, at Bezold's request, by Arnstein and Sustschinsky.‖

The main result of Bezold and Goetz's observations is to prove that Calabar bean causes death from true asphyxia, brought about by paralysis of the respiratory centre in the medulla oblongata, and that the poison is to the centres of involuntary motion (that of respiration excepted) what strychnia is to the centres of voluntary motion. Their experiments were made, not only with extract of the bean, but also with solutions of sulphate of physostigmine prepared from the extract. In consequence of its action on unstriped muscle, Calabar bean causes

* 'Reichert und Du Bois Reymond's Archiv,' 1867, p. 64.
† 'Journ. de l'Anat.,' 1867, p. 112.
‡ 'Trans. Roy. Soc. of Edinb.,' xxiv.'
§ 'Centralbl. f. die Med. Wissensch.,' 1867, p. 241.
‖ Ibid., p. 625.

spasm of the sphincter vesicæ, and great reflex excitability of the intestinal canal.

Dr. Fraser finds physostigma to be poisonous to every animal to which it has been administered except the Esere moth, and that it is absorbed by the skin and by serous and mucous membranes, as well as through open wounds. Its activity was not modified in the slightest degree by contact with the gastric juice of a dog for twenty-four hours, at a temperature of 95° Fahr. When large doses are given to mammals the heart becomes paralysed, but the post-mortem appearances are those of death from syncope. In moderate doses the symptoms produced are those of asphyxia. Artificial respiration does not prevent death in mammals after the exhibition of a fatal dose of the poison. After death the blood is found to be dark; but it becomes arterialized on exposure to the air, and often clots loosely and imperfectly. In the spectroscope the bands of O-Hb are found unchanged. Dr. Fraser enters into minute and eloborate physiological details as to the action of physostigma, into which, interesting as they are, we cannot here enter. His observations on the local effects of the drug are very important to the oculist.

Laburnum.—Several cases of poisoning by this plant have occurred in this country and on the Continent during the last two years,* the symptoms being those of local irritation and of narcotism (overwhelming sleep, weakness, and inability to walk). Husemann and Marmé† have recently described two alkaloids extracted from the laburnum tree. These observers state that the leaves of the tree are most active in April and May, the seeds and pods in October.

Mushrooms.—MM. Letellier and Speneux have investigated the poisonous principles of mushrooms.‡ In the eyes of these experimenters the distinction between the different genera and species is unimportant in a toxicological point of view. Their experiments were made with the *Hypophyllum crux militense*, the most deadly of all the tribe. The poisonous principles of several other species are identical with those of this plant. The administration of this fungus produces complex symptoms—vomiting, pain, and diarrhœa, succeeded by cold perspirations, syncope, and coma. These effects are produced by two distinct poisons present in the plant. One of these is an acrid, non-volatile substance, which produces the ordinary symptoms of a vegetable irritant—vomiting, pain, tenesmus, and bloody stools. MM. Letellier and Speneux are of opinion that the inflammation set up by this poison in the intestinal canal delays the absorption of the second and more fatal poison for some hours, for it is well known that narcotic symptoms often do not supervene till ten or twelve hours after the fungus has been eaten. This second poison acts only when absorbed, and is a pure narcotic, its effects being similar to those of narceine. It is obtained from the juice of the plant by a general process used for the extraction of the alkaloids, in the form of a deliquescent, uncrystallisable, brownish, colloid substance,

* *Vide* 'Hannövr. Ztschr. f. prakt. Heilk.,' iv, 5, p. 408; 'Schmidt's Jahrb.,' 138, p. 158.

† 'Handb. d. Toxikologie,' Supplb., 1867, p. 93.

‡ 'Ann. d'Hyg.,' xxvii, p. 71.

almost destitute of taste and smell, insoluble in ether and in the fixed and volatile oils, soluble in alcohol, very soluble in water. The name *amanitine* is assigned to this substance, which belongs to the class of bodies termed glucosides. The only good precipitant for it is tannin. Amanitine is disseminated through all parts of the plant; it resists prolonged desiccation, cooking, and even the action of powerful chemical reagents. A grain and a half injected beneath the skin of a frog's back, fifteen grains into a rabbit's flank, or seven and a half grains swallowed by a cat or a rabbit, caused commencing torpor in from ten to thirty minutes; and in from half an hour to six hours, according to the dose and the susceptibility of the animal, the senses were blunted, especially the hearing. The pupils were sometimes natural or contracted, rarely dilated. Hemiplegia or paraplegia supervenes, the respiration slackens, and the animal dies after tranquil coma or with slight transitory convulsions. On section no signs of local irritation or inflammation are visible, and the heart is slightly gorged with dark blood.

When the dose is insufficient to cause death the animal comes out of the state of torpor in five or six hours, and eats without any signs of *malaise*. The poison does not affect snails, for they feed on mushrooms with impunity.

The only antidotes are the administration of oily emetics and purgatives, in which amanitine is insoluble; and tannin, to precipitate the substance itself. Water, in which it is very freely soluble, is to be avoided. Animal and vegetable charcoal are of no avail.

No volatile poison was found in the species of mushroom experimented with.

Stramonium.—Liégey relates two interesting cases of poisoning by the *Datura stramonium*.* In the one case an adult took an infusion of 10 grm. (154 gr.) of the leaves; and after suffering from symptoms like those produced by belladonna—mydriasis, dysphagia, hallucinations—together with trismus, and redness and burning in the throat—recovered. In the other case, a child, æt. 2½ years, died in convulsions after partaking of the seeds of the thorn-apple. Here the peculiar redness of the skin and of the throat, the smarting in the latter, the frequency of the pulse, and the elevated temperature, caused the case to be mistaken for one of scarlatina.

Dr. W. Ogle has investigated the vexed question of the comparative immunity of rabbits to the poisonous action of atropine,† and arrives at the following conclusions:—1. That a rabbit of middle age can live for, at any rate, six days exclusively on belladonna without inconvenience. 2. That a rabbit can tolerate enormous doses of atropine, administered either by the stomach or by subcutaneous injection, and that this tolerance is not due to non-absorption of the poison. 3. That this tolerance increases with the age of the rabbit. 4. That dilatation of the pupils is, however, produced just as readily, if not more so, in an old rabbit than in a young one.

These conclusions are in accordance with the experiments of Dr.

* Virchow and Hirsch's 'Jahresber,' 1867, i, p. 474.
† 'Med. Times and Gaz.,' i, 1867, p. 466.

Camus,* who found 15 grains (1 gramme) to be a fatal dose for a rabbit.

The following notes refer to the poisonous action of gases:

Carbonic oxide.—Eulenberg abroad, and Dr. Gamgee in this country, have made new experiments with this gas, and record their results.

The former observer finds that the blood of animals poisoned by carbonic oxide exhibits a characteristic spectrum, even after aspiration of the dissolved gases by the air-pump; and that blood which has been treated with the gas, and allowed to dry, shows the same spectrum after the lapse of a month. In this he merely confirms Bernard's researches.

Dr. Gamgee gives an able summary of his own researches and those of other observers, in their bearings on the function of the colouring matter of the blood, and in their application to medical jurisprudence. It is in the latter aspect that they will now be discussed.

Having ascertained that blood forms with CO a definite compound, CO-Hb, the physical characters of which are identical, or nearly so, with those of O-Hb, but which differs from the latter in being incapable of yielding a less oxygenized substance when treated with reducing agents, it has also been determined that the florid colour of CO blood is not due to CO-Hb; for if pure crystallized hæmoglobin be dissolved in water, and the solution saturated with CO, whilst CO-Hb is formed (as is shown by the spectrum), the colour is only slightly heightened, and differs *in toto* from the colour of CO blood. These facts lead Dr. Gamgee to think that the peculiar coloration produced by CO in blood is due in great measure to an action on the physical characters of the blood-cells. After exposure to the vacuum of a good air-pump, and even after evaporation to dryness at 140° Fahr., CO blood is still irreducible. It, however, gives up its CO when treated with acetic acid. Do, then, these changes supply us with a means sufficiently accurate and delicate to warrant its employment in medico-legal investigations; and do similar changes occur in the blood when charcoal fumes have caused death? In poisoning by pure CO gas, Dr. Gamgee has invariably found, in experimenting on rabbits, dogs, frogs, and mice, that the peculiar coloration was induced in the blood; and not only was it observed in the blood, but likewise in special vascular organs. The remarkable carmine-red injection of the liver in CO poisoning is, indeed, a most striking appearance, and is quite characteristic. The kidneys, too, are usually of an exceedingly florid colour, and the muscles have a beautifully pink coloration, which, if once seen, can never be forgotten. He has also found the blood, in all cases of CO poisoning, either wholly or partially irreducible; but where it was partially so the reactions with reducing solutions were sufficiently characteristic to enable a certain opinion being given as to the cause of death. Since the cases of poisoning by pure CO are likely to be extremely rare, whilst cases where death has been caused by the fumes of charcoal, coke, or coal, do from time to time occur, a correct solution of the second part of the question, viz. as to whether, in poisoning by charcoal fumes, the changes occur which are characteristic of

* 'Gaz. Hebd.,' Aug. 11, 1865.

the action of CO, and whether the spectroscope affords us, in this case, valuable aid, is of the highest importance in a medico-legal point of view; since the means of affirming with certainty that a sample of blood has unmistakably been exposed to one of the products of combustion will often put a stop to a long, laborious, and useless investigation. In his own experiments Dr. Gamgee always succeeded in producing the singular coloration of the tissues and blood when animals were destroyed by the fumes of charcoal; but that this is not invariably the case is proved by the numerous cases of poisoning by charcoal fumes which are recorded, in many of which a dark colour of the blood was noticed. In some cases the florid colour of the blood noticed at first, disappeared after exposure to the air for a short time. That, at any rate, in a large number of cases of poisoning by charcoal fumes the CO which such fumes contain does induce its peculiar action on the blood, and thus aids in destroying life, is an undoubted fact. That, however, in others CO_2 is the agent which really kills, whilst in all it aids the fatal event, is proved by incontrovertible facts. Bernard believed that when CO_2 is inhaled it causes death by a purely physical action, putting a stop to gaseous interchanges between the blood-gases and the inspired air.*

That CO_2 acts injuriously in this way is exceedingly likely, although its poisonous action is due, no doubt, also to its power of displacing a portion of the O from the hæmoglobin. As, then, the action of charcoal fumes must be due to the hæmoglobin being, under the influence of the CO, changed in constitution, and rendered unfit for respiratory changes, or to the hæmoglobin being deprived of O by CO_2, whilst the interchange of gases is arrested by this gas, and as the two latter causes are quite sufficient to produce death, and may exist where the first does not, it is obvious that in some cases of poisoning by charcoal fumes the blood will be found of a dark and venous, and not of a florid colour, and unchanged in its reaction with reducing solutions. The fact that the blood is dark does not prove, however, that such blood is reducible, since it has been often found that blood which has been only partially saturated with CO, and has after a lengthened exposure to the air lost its florid colour and become apparently venous, is not completely reduced when treated with reducing solutions. Now, an incomplete reduction is, for medico-legal purposes, as important as the complete absence of reduction, and can be relied on with perfect safety. And although we cannot positively affirm, from the absence of certain changes in the blood, that death has not been caused by charcoal fumes, in a large majority of cases such positive evidence will exist as may justify a very decided opinion being pronounced.

The notes which follow refer to the chemical processes employed in testing for the presence of various poisons.

Sublimation of the alkaloids.—In 1864 Dr. Helwig, of Mayence,† proposed sublimation as a test for the alkaloids, and in 1865. he published a book on the subject,‡ illustrated by numerous photographs

* Bernard's 'Leçons,' p. 207.

† 'Vierteljarsschr. f. analyt. Chem.,' 1864, 1.

‡ 'Das Mikroskop in der Toxikologie,' Mainz, 1865.

exhibiting the appearances of the sublimates of the principal poisonous organic bases and the effects of reagents upon them. Previously it was generally supposed that most of the alkaloids could not be volatilized without decomposition; hence the division into non-volatile and volatile organic bases. Dr. Guy, taking up the subject, has greatly expanded and improved the method, and to him we are indebted for several papers* upon it. His method of procedure is as follows:—A small porcelain crucible-cover is placed on the ring of a retort-stand. A minute portion of the suspected white substance, not exceeding the 1-100th of a grain in weight, is placed in the centre of the porcelain; or a drop of a solution of the substance in any convenient solvent is evaporated to dryness on the crucible lid. A microscopic cell-glass of the thickness of about 1-8th of an inch, and having a diameter of circle of 1-3rd of an inch, is then placed on the crucible-lid so as to surround the suspected matter. A clean disc of window-glass the size of a shilling is gently warmed in the flame of a spirit-lamp till moisture no longer condenses on its surface, and is adjusted with forceps over the glass cell. The flame of the lamp must now be carefully applied to the crucible cover beneath the powder, and the application of heat continued until the substance undergoes its characteristic change and gives off vapour. The deposit of this on the glass disc is watched, and the spirit-lamp removed, either directly or after a short interval, as experience may determine. When a sufficient deposit has been obtained, the glass disc can be removed and replaced by a second, and so on; as many as fifteen sublimates having been thus obtained from a minute portion of an alkaloid. From these sublimates others of a second order may be obtained by a similar procedure, and there is scarcely a limit to the extent to which the sublimation may be carried. Helwig, by a somewhat ruder method of procedure, obtained crystalline sublimates from two alkaloids—veratria and solamia; whilst morphia, strychnia, brucia, aconitia, atropia, and the glucoside digitaline, yielded non-crystalline sublimates, which, however, afforded more or less characteristic crystals when treated with various reagents. Dr. Guy, by the more careful method we have just detailed, has obtained crystalline sublimates from some of the alkaloids with which Helwig failed, and has obtained characteristic reactions of great beauty by treating both crystalline and non-crystalline sublimates with various reagents, such as distilled water, dilute hydrochloric acid, aqueous solutions of carbazotic acid, bichromate of potash, and nitro-prusside of sodium. Dr. Guy divides the sublimates, according to their appearance, into three varieties—the *crystalline*, the *watery*, and the *smoked*. They are best examined under an inch-power of the microscope. The sublimate of strychnia, when treated with carbazotic acid, affords, according to that experimenter, a most certain, delicate, and characteristic test for the alkaloid. The results are summed up by him as follows:—1. That the method of subliming substances in minute quantities on flat surfaces of glass, in order to their complete examination by the microscope—a method first recommended for such poisons as arsenious acid and corrosive sublimate

* 'Pharm. Journ.,' ix, pp. 10, 58, 106, 195; 'Princ. of Forensic Med.,' 3rd ed., p. 382.

nearly ten years since—may be advantageously extended to the alkaloids and other analogous active principles, and also to many other volatile and decomposable matters, both animal and vegetable. 2. That, in the case of the alkaloids and analogous active principles, the best form of apparatus is that which consists of a slab of white porcelain, a microscopic cell-glass, and a disc of window-glass. The flame of the spirit-lamp is to be cautiously applied to the porcelain, and the heat gradually increased till the sublimate shows itself on the disc of glass, previously deprived of moisture by being passed through the flame. The lamp is to be then withdrawn, and the process repeated till the substance refuses to yield any further sublimate. 3. That in operating on deposits of the alkaloids obtained from their solutions, the deposits should be collected on small fragments of glass, which should be completely enclosed in the cell-glass, so that the deposit may be contained in a short shallow tube, and be deposited on the glass disc without loss. 4. That by this method of procedure highly characteristic results are obtainable with a large number of substances, and notably with the alkaloids and analogous active principles; these results consisting of visible changes of colour, consistence, and form on the heated white porcelain slab, as well as of characteristic microscopic appearances in the sublimate itself, both before, during, and after the use of reagents. 5. That while the alkaloids, as a class, change colour, melt, fume, and deposit carbon, several of the most important poisonous alkaloids yield sublimates which are either highly characteristic themselves or behave characteristically with reagents, or possess these properties jointly. 6. That the salts of the alkaloids yield sublimates. 7. That, taking strychnia as the type of the alkaloids, it may be inferred that deposits of the alkaloids from their solutions will yield sublimates of characteristic forms and reactions, even when the deposit itself is amorphous and cannot be identified. 8. That strychnia, and probably other alkaloids, will yield sublimates prior to melting or even change of colour; so that if the process were not carried out to its full extent (*i. e.* the deposit of carbon), and the microscopic appearances of the sublimate were disregarded, it would be possible to confound powdered strychnia with arsenious acid, corrosive sublimate, or cantharidine. 9. That characteristic results are readily obtained with such small quantities as the one thousandth of a grain or less of strychnia, and that sublimates consisting of one five-thousandth, or even as little as one ten-thousandth of a grain, are found to have characteristic properties when examined by the microscope, and to have equally definite reactions. Similarly minute quantities are found to suffice in the case of morphia and of some other alkaloids. 10. That even those sublimates which do not possess the most distinct microscopic characters, but belong to the class which has been designated as "watered" or "smoked," are found to give with reagents highly characteristic appearances. This statement rests mainly on repeated experiments with morphia. 11. That in the choice of reagents care should be taken to avoid such saline solutions as give variable crystalline deposits, and that in any case we should avoid confounding the crystalline forms proper to the reagent (a mistake committed by Helwig) with those due to its action on the sublimate.

12. That the results obtained by sublimation, in the case of the alkaloids and analogous active principles, are not more subject to failure than other tests; that several of the reactions are remarkable for delicacy, constancy, and characteristic appearances, and greatly surpass in beauty and distinctness those obtained with deposits of equal weight obtained by evaporating solutions.

It remains to be seen whether these results will be available to the practical toxicologist; and this will depend in great measure on the behaviour of such deposits from solutions of the alkaloids as are extracted from the viscera. Dr. L. Sedgwick* advances some objections to this method, and urges the value of the iodo-sulphate test for the alkaloids.

Picrotoxin.—This bitter principle, the active ingredient of grains of Paradise, so much used in the adulteration of beer, has been investigated anew by Dr. Köhler, of Halle;† and he has perfected the chemical processes employed for its detection. He recommends ammonia to be added to the beer or other fluid under investigation till it smells strongly of the reagent. If only a qualitative analysis is required, the precipitate which forms is allowed to subside, and the clear supernatant liquid poured off, no filtration being necessary; but if a quantitative determination is requisite, the liquid is to be filtered, concentrated, and precipitated with a hot solution of acetate of lead in excess. The precipitate is to be collected on a filter, and edulcorated with hot alcohol, in order to remove all picrotoxin. The filtrate and washings are united, and the excess of lead removed by sulphuretted hydrogen. After filtration the liquid is concentrated to a small bulk, and then shaken repeatedly with ether. The ether is then decanted off and allowed to evaporate spontaneously, when any picrotoxin which may be present will be left behind in the form of slightly coloured, stelliform needles. The rationale of the process is that ether removes picrotoxin from its aqueous solution, whilst the salts of the alkaloids, with the exception of colchicin, are not so removed. Digitalin is removed by ether in the same manner as picrotoxin. If now the ethereal solution be shaken with a dilute solution of potash, colchicin alone is retained by the ether. From digitalin, picrotoxin may be separated by tannin, which precipitates the former, but not the latter substance.

The crystals of picrotoxin obtained as above may be purified by moistening them with a small quantity of water, rapidly pressing them between folds of bibulous paper, and recrystallizing from hot alcohol.

Thallium.—Marmé‡ recommends the combined use of the electrolysis and the spectroscope for the detection of this metal in the blood and other animal fluids. The metal is received on a negative electrode of platinum, which is then introduced into the flame of a Bunsen's burner, and the flame examined by the spectroscope.

* 'Pr. St. Andrew's Med. Grad. Assoc.,' i.
† 'Berl. Klin. Wchnschr.,' 1867, p. 489.
‡ 'Schmidt's Jahrb.,' 135, p. 286.

Blood-stains.

Dr. Falk,* of Berlin, recommends an important modification in the usual mode of preparing blood-stains for spectroscopic examination. He was led by Helwig's successful employment of a solution of iodide of potassium instead of a solution of chloride of sodium in preparing hæmine crystals, to try the same solvent in extracting the colouring matter of the blood for spectroscopic purposes. He was surprised to find with what facility even old blood-stains dissolve in this solution, whilst the dyes imprinted on the stuff do not so readily dissolve, and thus no impediment is offered to the direct use of the spectroscope. As Hoppe had previously shown, carminic acid might be mistaken for blood, but the spectra of the two substances are clearly distinguishable from one another.

Sonnenschein† gives an elaborate paper containing some useful modifications of the ordinarily received methods of examining bloodstains. These are chiefly ocular inspection by artificial light rather than by daylight, drying the solution of the colouring matter in a watch-glass at a low temperature, and submission of the dry residue to spectroscopic examination. The residue may then be dissolved in water, and submitted to the action of the usual chemical reagents.

Dr. A. S. Taylor‡ has worked out Van Deen's guaiacum blood-test to a satisfactory conclusion. Freshly precipitated resin of guaiacum is not coloured blue by the class of bodies known as *antozonides*, such as the so-called "ozonized" ether, oil of turpentine, peroxide of hydrogen, &c.; whilst *ozonides*, such as permanganate of potash and the persalts of iron, turn the resin blue. The colouring matter of the blood has no tinctorial action on guaiacum. If, however, a drop of an antozonide solution be added to a mixture of blood and guiacum, a beautiful blue colour is immediately developed. The antozonide which Dr. Taylor prefers for this purpose is the ordinary commercial solution of peroxide of hydrogen. The best mode of applying the test is to add a little of the suspected liquid to tincture of guaiacum rendered turbid by the addition of water. Should the mixture become blue, the test is inapplicable; if, however, no blue tint is developed in the course of a few seconds, a few drops of a solution of the peroxide are added, when the development of a blue colour is conclusive as to the presence of blood. Should the colour of the mixture be obscured by the turbidity, the addition of a little alcohol will remove this, and bring out the colour. The order in which the mixture is made is important. The test is a very delicate one.

M. Blondlot has arrived at the following conclusions, drawn from experiments made with blood stains§:—1. That the surest and most sensitive reaction for the detection of blood in supposed blood-stains is the production of crystals of hæmine. 2. That this proceeding

* 'Horn's Vierteljahrsschr.,' vi, p. 354.
† 'Virchow's Jahresbcht.,' 1867, i, p. 592.
‡ 'Guy's Hosp. Rep.,' 1867, p. 431.
§ 'Ann. d'Hyg.,' xxix, p. 130.

presents no difficulties in its execution, requiring merely some precautions which are known and easily realised; among these M. Blondlot recommends the use of ammoniacal alcohol for the extraction of the stains instead of water. 3. That in certain cases the test fails, so that, though the production of the crystals establishes the presence of blood, their non-production cannot be accepted as a conclusive proof of its absence.

Seminal stains.—M. Roussin publishes an able account of the best method of examining suspected stains of semen.* After noting the number, situation, and physical appearances of the stains, he advises portions of the articles of clothing on which they are found to be carefully treated with a couple of drops of cold water in a watch-glass. After a couple of hours' digestion the threads of the fabric are to be torn asunder, thread by thread, with great care, by means of dissecting needles. Spermatozoa often adhere very firmly to the filaments of the garment, and cannot be dislodged by simple maceration in water. It is therefore usually necessary to examine the fabric itself. If seminal stains be moistened with a solution of one part of iodine and four parts of iodide of potassium in one hundred parts of water, the spermatozoa are brought into prominence, and are readily distinguishable from other objects under the microscope.

Wounds.

Of the throat.—Dr. Taylor publishes a long and exhaustive article on this topic, *apropos* of the case of John Wiggins,† who was tried at the Central Criminal Court for the murder of Agnes Oaks, on the 25th September, 1867. In consequence of the late appearance of the article we are unable to give our readers more than a reference to it.

Of the genitals.—M. Toulmouche ‡ contributes some valuable cases of those little-described injuries—wounds of the genitals. One of them, a case of castration of the right testicle, is specially interesting, inasmuch as M. Toulmouche was enabled to state, from the appearance of the wound, and in spite of the obstinate silence of the patient, that the castration must necessarily have been performed by a second person. The recipient of the injury must have been forcibly held. The tunica vaginalis was neatly opened from above downwards, the testicle drawn out, and the cord divided above in an artistic manner. For further details we must refer to the paper itself.

Suffocation.

Prof. Tardieu publishes a paper on the value of subpleural ecchymosis as a sign of death from suffocation.§ The value of ecchymoses beneath the pleura, pericardium, and pericranium, as a characteristic sign of death from suffocation, even when no signs of violence are found on the exterior of the body, has been doubted; but Tardieu is convinced that it is of great value, and endeavours in this paper to place the test on a sure basis.

* 'Ann. d'Hyg.,' xxvii, p. 142.
† 'Guy's Hosp. Rep.,' 1868, p. 112.
‡ 'Ann. d'Hyg.,' xxx, p. 110.
§ Ibid., xxix, p. 104.

Two serious objections have been urged to the test:—1. That subserous ecchymoses are not constantly met with in all cases of death from suffocation. 2. That ecchymoses may be found beneath the pleura and pericardium in other conditions—in the course of disease, after injuries, or in the infant in peculiar circumstances, &c.

Tardieu meets the first of these objections with the answer that the hundreds of positive cases in which he and others have proved the presence of ecchymosis cannot be weakened by the cases in which it has been stated to be absent, for they are very exceptional; and that this is a question of observation and experience. The second objection he meets by pointing out that error and confusion of diagnosis are too often thought to be possible because the lesions have not been sufficiently well observed and contemplated, and that in all cases of this sort there are certain means of preventing other ecchymoses being mistaken for those produced by suffocation. Hæmorrhagic affections, more especially purpura, some severe forms of eruptive fevers, and pestilential diseases, notably typhus and cholera, are the chief forms of spontaneous disease in which subpleural and subpericardial ecchymoses have been observed. But these ecchymoses must not be confounded with those produced by suffocation. The latter are very much smaller, regularly rounded, and strictly circumscribed, being formed by a small drop of coagulated blood. The former are larger and more irregular, always fluid, diffuse, and mostly of a violet and livid hue; moreover, the circumstances under which they are formed, their number, distribution through many organs, and the effusions of blood with which they are accompanied, allow of no mistake.

In the ecchymoses found beneath the serous membranes in poisoning by arsenic, mercury, phosphorus, and digitalis, sufficient diagnostic characters are furnished by the dissemination of the spots, their varied seat, the frequent presence of sanguineous infiltrations in the gastro-intestinal mucous membrane, the presence of abdominal lesions and hæmorrhagic evacuations. Strychnia and hydrocyanic acid, in consequence of the rapidity of death and the long-continued fluidity of the blood which they produce, give rise to a state of partial and irregular congestion, and in many cases effusions of blood and the formation of apoplectic deposits on the surface of the heart and lungs; but Tardieu has proved that these poisons do not give rise to the small, sharply defined ecchymotic spots of suffocation.

Some convulsive diseases, as epilepsy, occasionally give rise to ecchymoses but these are chiefly external, and are rarely formed in internal organs.

In hanging, according to Tardieu's experience, no other appearances are observable in the lungs save a general engorgement of blood, and occasionally circumscribed emphysema; never circumscribed effusions or ecchymoses beneath the pleura and pericardium. He says that he cannot admit that punctated ecchymoses beneath the serous membranes of the heart and lungs, and under the pericranium are found after hanging. In drowning there is much congestion of the whole extent of the viscera, and these are frequently covered with spots formed by hæmorrhagic effusions, but they are very different in appearance from

the circumscribed spots of ecchymosis characteristic of death from suffocation.

Ecchymosis undistingushable from that of suffocation may be produced by very severe injuries causing great disturbance in the mechanical processes of respiration, or paralysing movement, though a kind of struggle takes place, and the individual, who cannot breathe, finds himself in a condition analogous to that of suffocation. Such injuries are crushing, falls from great heights producing fractures of the ribs, rupture of the diaphragm, and injuries to the spinal cord. Here there is no obstacle to the entrance of air into the respiratory passages, but rather paralysis of the agents of respiration. The diagnosis in these cases is easy. Over and above the ecchymosis there will be numerous external and internal lesions.

In conclusion, Tardieu says that it is his firm conviction that, with one reserve which he mentions, the above changes, and chiefly extravasations disseminated beneath the pleura and hairy scalp, in whatever degree and however few in number they may be, suffice to demonstrate positively that death has occurred from suffocation. With these lesions there are often, though not constantly, associated, ecchymoses beneath the pericardium, rupture of some superficial pulmonary vesicles, and the presence of a fine white or rosy froth in the air-passages. Along with these there may be various external marks of violence, such as flattening of the nose and lips, excoriation of the face, &c.

Prof. Liman* says that these dicta of Tardieu's cannot be too energetically repudiated, and adduces from his own experience many cases which refute them. Having critically examined each of Tardieu's assertions, Liman comes to these conclusions:—That there is no specific internal appearance which enables us to distinguish between hanging, strangulation, smothering, and throttling. A bloody mark of the ligature is sometimes observable in both hanging and strangulation. Where an effusion of blood has occurred, either in the course of the ligature or in its neighbourhood, it may be concluded that force has been applied to the neck other than the instrument of strangulation. If the neck be encircled by a ligature and this is allowed to remain on the corpse, no mummified or excoriated mark of strangulation will be exhibited except when the skin has been simultaneously broken.

M. Ssabinski† criticises Tardieu's test very sharply. Under the term "suffocation," the latter includes the death of a patient from confinement in a limited space (which, as Ssabinski points out, is rather a kind of poisoning), whilst he excludes hanging, drowning, and strangulation. In 27 cases of suffocation as thus defined, Ssabinski has found punctated ecchymoses on the heart in only one case, and then they were present in very inconsiderable quantity. This was a case of death from compression of the chest and abdomen. He adduces evidence showing that Casper and Maschka had noticed these ecchymoses before Tardieu described them, and that those observers, whilst fully recognising their value as evidence of death from suffocation, did not consider them as

* 'Horn's Vierteljahrsschr.,' viii, p. 278.

† 'Russ. Arch. f. gerichtl. Med.,' März., 1865; trans. in 'Horn's Vierteljahrsschr.,' vi, p. 146.

absolutely diagnostic, since they are frequently present in other modes of death; and this assertion is supported from the writings of Bayard, Liman, and Maschka.

Ssabinski, moreover, supports his statements by quoting many cases from various authors where ecchymoses were observed when the cause of death was certainly not suffocation, and others of death from suffocation where no ecchymoses were observed. He consequently concludes that Tardieu's test is quite unreliable, especially when the question is whether death has resulted from suicidal or homicidal violence.

Ssabinski, in his experiments, was led, however, to notice a very remarkable diagnostic sign of suffocation—anæmia of the spleen, a condition which he thinks to be a constant result of suffocation. This is the more remarkable inasmuch as the spleen forms part of the same circulatory system as the stomach, liver, and other organs, which, in such cases, are found highly congested after death. Ten animals (dogs and cats) were destroyed by compression of the chest and abdomen, burying in sand, throttling, hanging, and drowning, and in every instance the spleen was found to be very anæmic; whilst Tardieu's ecchymotic spots were observed in only one case, of death from compression of the chest and abdomen in a dog. Two puppies had their spleens exposed, and small incisions made in them, from which blood flowed freely. The nose and mouth of the animals were then closed. Besides the usual signs of suffocation, the spleen in each case was seen to contract and become wrinkled, bloodless, and dry. The blood ceased to flow from the incisions. In one of the puppies the transverse diameter of the organ contracted from 5 mm. to 2 mm. On removing the obstruction from the mouth and nostrils the animal recovered, and the spleen gradually regained its normal size and appearance. On again obstructing the mouth and nostrils of one of the puppies the phenomena were repeated. The other puppy had the diaphragm slit up, when, as a consequence, the spleen again contracted and became anæmic. The same results were obtained when the vagi were divided before suffocating the animal. When, however, the nerves and vessels of the spleen were tied, with the exception of one very small cord in which the arteries and nerves were left untouched, hyperæmia was the result. When the death ensued from opening the pleural cavity anæmia of the spleen was still observed.

Asphyxia.—Dr. Ivan Gwosdew,* of Moscow, has investigated the blood-spectrum in cases of death from asphyxia, and by a beautiful mechanical contrivance has obtained the blood in a fit state for microscopic examination, without allowing access of air. His communication, which is a preliminary one, holds out good hopes of a new and valuable practical test being added to forensic medicine.

Infanticide.

Breslau † has laid down the following propositions:—(1) In still-

* 'Du Bois Reymond's Archiv,' 1868, p. 635.

† 'Monatsschr. f. Geburtskunde,' xxv, p. 238.

born children and in fœtuses that have undergone intra-uterine maceration, no collection of gas is found in the stomach and intestines. (2) In conformity with this, the intestinal canal sinks in water, as a whole and when divided into pieces. (3) When respiration is established gas collects in the intestines from above downwards. (4) The first impulse to this collection of gas is probly due to the act of swallowing air. (5) Subsequently to the first act of respiration gas may be found in the stomach. (6) According as respiration has been more or less complete, and of longer or shorter duration, the coils of intestine become more or less distended with gas. Of this we can assure ourselves by percussion of the abdomen of a living child, or examination of the body of a stillborn child.

Liman* adduces the autopsies of 84 cases in criticism of Breslau's conclusions, dividing them into five groups. The first of these comprises those in which the body had not undergone putrefaction, and where proof of respiration having taken place was obtained by the hydrostatic lung-test. In 43 out of 45 such cases the stomach floated in water, and in one case it sank. The other case presented many anomalies, which need not occupy us here. The second group includes those cases in which the body, though unputrefied, yields no proof of respiration by the hydrostatic test. In 6 cases of this nature the stomach floated in water twice, and sank four times. The third group embraces those cases where the already putrid corpse still affords proof of respiration having occurred. In all these, 9 in number, either the stomach or the intestines floated in water. In one the stomach floated, whilst the intestines sank; in another, the intestines floated and the stomach sank. The fourth group consists of the cases in which the putrid body affords no satisfactory proof of respiration having been set up. In 8 out of 12 such cases the stomach and intestines floated, whilst in 4 they sank. In one, whilst entirely negative results were obtained by the hydrostatic test, the stomach and intestines showed, according to Breslau's dicta, that the child must have survived its birth at least 24 hours. The fifth group comprises those cases in which putrefaction had advanced too far to permit of the application of the hydrostatic lung-test. In all these, 12 in number, the stomach and intestines, even when divided into the smallest pieces, floated in water. It is to be noted that in the first group buoyancy of the upper part of the small intestines was no guide to the length of time the child had lived, although buoyancy of the whole length of the small intestine was met with only when the child had survived its birth several hours.

Liman consequently is unable to assent to Breslau's conclusions, but thinks, nevertheless, that the test is of use in confirming the conclusions drawn from the hydrostatic lung-test. In bodies that have not undergone putrefaction, where the hydrostatic test yields affirmative results, and where the stomach and the whole or greater part of the small intestines float in water, it may safely be affirmed that the child has lived for some time after its birth. When the hydrostatic test affords doubtful results, or when putrefaction has advanced to such a

* 'Horn's Vierteljahrsschr.,' viii, p. 1.

stage that the abdominal organs are softened, Breslau's test is, according to Liman, inapplicable.

Prof. Maschka* also adduces cases in refutation of Breslau's assertions, and quotes 2 cases of children who had undoubtedly survived some time after birth, and where the stomach and intestines sank in water. In another case the hydrostatic test completely failed, and yet the stomach and intestines were buoyant. In a stillborn child the lungs sank, whilst the stomach and intestines floated. Maschka thinks that the test fails in those cases where we most need it, viz. when the hydrostatic test yields negative results, and when putrefaction is too far advanced to admit of the application of the proposed test.

Cold.

Dr. Höche† contributes a paper on death from severe cold, and the diagnosis of this form of death. After an elaborate review of the various opinions that have been advanced as to the physiological cause of death from cold, he comes to the conclusion that the immediate cause is most probably neuroparalysis, or else paralysis of the heart, and more rarely pressure on the brain. With respect to the post-mortem appearances, he thinks that none of the external appearances—such as freezing and brittleness of the limbs, the absence of decomposition, and the peculiar "corpse" smell, redness and a bloated appearance of the prominent parts, brown streaks in the course of the veins (from thawing), peculiar gelatinous clots in the blood-vessels, separation of the bones at the coronary and sagittal sutures—are of any probative force; while *cutis anserina*, contraction of the male genitals, rigid and shrunken muscles, circumscribed erythematous redness of the arms, red spots on the face, neck, arms, knees, and exposed parts, are of more value. Internally, hyperæmia of the brain and lungs, bright carmine-coloured blood, emptiness or fulness of the stomach, and excessive fulness of the bladder are slight helps towards diagnosis; whilst great distension of the heart, with more or less coagulated, thick, black blood, that becomes only slightly reddened on exposure to the air, is of far more import. An accurate opinion as to the cause of death may generally be arrived at from the consideration of the degree of cold to which the body has been subjected, the possibility of the body having lain long unobserved in the locality in which it was found, the *totality* of the post-mortem appearances, and the presence or absence of lesions which might have caused death independently of exposure to cold. The cornea, if found to be resistent, may aid in forming a diagnosis; otherwise no conclusion can be drawn from its state.

Simulation.

Epilepsy.—Dr. Voisin‡ has successfully applied the sphygmograph to the detection of simulated epilepsy, a form of simulation which appears to be much practised in France in order to avoid the conscrip-

* 'Prag. Vjhschr.,' xciii, p. 134. † 'Horn's Vierteljahrsschr.,' ix, p. 44.
‡ 'Ann. d'Hyg.,' xxix, p. 358.

tion. His plan of procedure is to take a drawing by the instrument during the interval between two attacks; when the individual is apparently in good health; and again after the convulsive movements observed during a fit have passed away. He sums up his conclusion sthus :— (1) Epileptic fits and simple vertiginous attacks produce alterations in the circulation which can be recognised by the sphygmograph, and which are characterised by very pronounced curves, ascending lines of great height, and a well-marked dicrotism that lasts from half an hour to several hours. (2) These sphygmographic forms are not obtained as a result of gesticulations, violent exertions, &c., simply. (3) The pulse of simulated epilepsy differs altogether from that of real epilepsy. (4) Given a person who simulates epilepsy, it is sufficient to take several sphygmographic sketches of the pulse, before and just after the attacks, in order to detect the imposture.

Paralysis.—A highly instructive case of simulated paralysis is detailed by Tardieu. A gentleman brought an action against a railway company two years after an accident, alleging that he was suffering from permanent paralysis of the right inferior limb. A difference of opinion existing among the surgeons employed, M. Tardieu was commissioned to examine the patient. A very conclusive opinion that the paralysis was simulated was grounded on the facts that, notwithstanding an old and perfectly repaired fracture of the pelvis, the paralysed limb was perfectly mobile, of larger size than its fellow, and well nourished. Both limbs were of equal length when the patient lay supine. When walking by the aid of a crutch the muscles of the affected member became rigid (a circumstance which accounts for the greater girth of the limb), and there was none of the peculiar dragging observed in real paralysis. Moreover, the general health was excellent, there was no paralysis of the bladder or rectum, and the sexual appetite was said to be unimpaired.

Insanity.

The Lunacy Commissioners of England, Scotland, and Ireland, have issued blue-books containing statistics of insanity in the United Kingdom to the commencement of 1867. It is to be regretted, however, that, owing to the paucity of details in these statistics, their value is very much diminished. At the date we have mentioned the total number of lunatics under the supervision of the English Commissioners was 49,082, of whom 22,635 were males, and 26,717 females. This shows an increase of 45 per cent. since 1857. The number of pauper lunatics returned as curable is only 10 per cent. In Scotland the returns are given only to the commencement of 1866. The total number of lunatics was 6662; this gives an increase for eight years of 15⅓ per cent. In Ireland there were 8964 lunatics, and in 1864 only 8272, so that, with a decreasing population, there has been an increase in the number of insane persons. It is a disputed point, however, whether lunacy is on the increase in the United Kingdom, or whether the increase in the number of insane people under the care of the Commissioners

* 'Ann. d'Hyg.,' xxx, 1, p. 100.

is due to greater supervision. It is certain, at all events, that many lunatics are now placed in public and private establishments who formerly were left at large, and in this way a considerable increase may be accounted for.

M. Brierre de Boismont concludes a long article on moral insanity, entitled "De l'Importance du Délire des Actes," with the following propositions:*

(1) There exists a variety of mental aberration in which the subjects express themselves with every resemblance of reason, and which is called reasoning folly (*folie raisonnante*)—the moral insanity of the English. A knowledge of it is acquired with the greater facility the more the sane man, from whom the insane one is a derivation, is observed. (2) This variety of insanity is met with in different forms, more especially in those of maniacal excitement, melancholia, impulsive monomania, &c. (3) This manifestation of insanity, which is but a symptom, is sometimes so predominant that the accessory seems to occupy the place of the principal affection. Prolonged observation of cases of this kind generally ends in the discovery of some of the principal symptoms of mental aberration. (4) The decisive characters of reasoning folly are the delirium of acts and instinctive evil propensities, contrasting with rational discourse. Intellectual disorder will, however, frequently show itself in conversation when the patient is not on his guard. (5) The persistence of reason in the speech of these patients, an almost indestructible attribute of this faculty, may present itself in the patient's writing, but when he is observed for any length of time the delirium of acts is revealed also in his letters. (6) The recognition of reasoning insanity is very important from a medico-legal point of view, as the subjects of this affection are generally inclined to do mischievous acts. Anonymous and calumnious charges, plotting, false and imposing letters, lying in every form, suicide, homicide, accusations of bodily violence, theft, immorality, lawsuits for unjustifiable impeachment, &c., are the common acts of reasoning lunatics. (7) An important differential character separates the individual who is mentally sane from the reasoning lunatic. The former, when he is not guilty, repudiates any evil impulse, or repents of it if he has been acting under such an impulse; the reasoning madman, on the other hand, hardly troubles himself about such acts, and seldom thinks that they are reprehensible. (8) Another character, which is not of less value, is the impossibility of the patient carrying out any steady course of action during the persistence of his illusions. (9) Finally, when the reasoning fool hides his ideas, causes doubt about them, and does not commit hurtful acts, the only course is to permit him his liberty, warning him that he is the arbiter of his lot in life.

Moral insanity is a disease not recognised by our English law-courts; moreover, it is certain that some of the cases given in detail by M. Brierre de Boismont would not be considered to be cases of insanity in this country, whilst in others there were periods of undoubted mental aberration.

* 'Ann. d'Hyg.,' xxvii, p. 76, 354.

Dr. J. Ray discusses delusion considered as a test of insanity.* Delusion has been defined to be "the belief of facts which no sane man would believe," and as "a belief in something extravagant, having no existence whatever, and out of which the person cannot be reasoned by any conceivable degree of evidence;" and again, "delusion is a belief of facts which no rational reason would have believed." In these definitions the very point to be proved is assumed. Dr. Ray would define a delusion to be a belief in something impossible; the impossibility being not in the nature of things, but in the circumstances of the case. In order to determine whether a certain belief is a veritable delusion, or only the mistake of a sane mind, it may be necessary to scrutinise the psychological character and experience of the individual who entertains it. Thus, Luther's firm belief of the personal appearance of the devil to him was, at the worst, an hallucination, and not an insane delusion. These differ from each other in this respect, that the false belief implied in the former is connected with impressions made on one or more of the senses, and does not necessarily prove, as the latter does, any derangement of the understanding. The two elements of Luther's belief are easily accounted for without resorting to the theory of insanity. The apparition itself was the result of certain cerebral conditions of a casual transient nature; and, secondly, the persistent conviction of its reality was consistent with the common belief. Many false beliefs springing from a coarse superstition can be distinguished from genuine delusions only by a careful investigation of the individual's mental habits and associations.

* 'American Journ. of Med. Sc.,' lvi, p. 73.

REPORT

ON

MATERIA MEDICA AND GENERAL THERAPEUTICS.

BY

DR. THOMAS STEVENSON.

VERY few new remedies have been introduced into medical practice since the publication of the last volume of the 'Retrospect.' The following may, however, be mentioned:

Eucalyptus globulus.—Dr. Ullersperger* recommends this plant as a valuable febrifuge and intermittent. It has been found useful in ague when quinine has failed.

Kinovic acid.—Dr. Kernert states that this acid is the chief cause of the tonic properties of cinchona bark, and recommends its employment as a therapeutic agent. He employs kinovate of lime as the best form for the administration of the acid; to be given in the form of powder. When given even in large doses it produces no cerebral congestion, as the nitrogenous constituents of bark do, and adults experience not the slightest ill effects after taking daily half or three quarters of an ounce of the salt. It acts as a bitter and tonic, and is superior to most other bitters. Its most striking effect is upon the peristaltic movement of the intestines, which is at once abated; hence the remedy is a valuable one in severe dysentery and in nervous diarrhœa. Forty grains of the kinovate of lime in powder, or the same quantity in water, to which sufficient phosphoric acid is to be added to precipitate the kinovic acid, is an average dose.

Anæsthetics.—Since the issue of the last 'Retrospect' the English medical journals have been full of discussions upon anæsthetics. First, Dr. Protheroe Smith reintroduced the tetrachloride of carbon; then Dr. B. W. Richardson discovered a new anæsthetic agent, the so-called bichloride of methylene; and, lastly, the American plan of producing anæsthesia by protoxide of nitrogen (laughing gas) has been introduced into this country, and extensively employed. The first of these agents is now seldom heard of; the second does not appear to have sustained

* 'Wien. Med. Presse,' xii, p. 29. † 'Deutsche Klin.,' xx, p. 81.

the hopes entertained of it by its discoverer, and, indeed, it appears to be doubtful whether the substance prepared by Dr. Richardson's process is anything but a mixture of chloroform with other and more inert substances. Certain it is that much of the bichloride of commerce is nothing more than diluted chloroform. The use of protoxide of nitrogen has given rise to lively discussions. The opponents of its use say that the physiological state it induces is that of impending asphyxia, whilst those who favour its use would assign to it a widely different action. Its chief advantages appear to be the rapidity with which unconsciousness is induced, the very transitory nature of the anæsthesia produced, and the absence of unpleasant after-effects.

The following notes are taken from some of the principal papers having reference to the determination of the active principle of various medicinal substances:

Messrs. T. and H. Smith* have extracted from opium a new alkaloid, to which they assign the name *cryptopia*. This base has been obtained from the drug in only very small quantities, four or five tons of the drug having yielded not more than five ounces of cryptopia. This substance possesses the same strongly alkaline properties as morphia, codeia, and thebaia; from all of which, however, it is readily distinguished by the beautiful blue colour it yields when treated with strong sulphuric acid, and by the gelatinous form which all its salts assume when their solutions are cooled. Another constituent of opium—papaverine—also strikes a blue colour with concentrated sulphuric acid; but in this case the tint is much fainter, and the addition of a fragment of nitrate of potash to the mixture changes the blue into an orange colour, whereas cryptopia, under similar circumstances, affords a green colour. The formula $C_{23}H_{25}NO_5$ has been assigned to cryptopia by Dr. Cook, late of King's College. It appears to be quite distinct from Pelletier's pseudomorphia, though in some of its properties it resembles this body.

Baobab.—M. Martin has recently examined the leaves and bark of this gigantic tree (*Adansonia digitata*), first described by Adanson†, which grows in Senegal to an enormous size, some specimens measuring eighty feet in circumference. The decoction and the infusion of the leaves are in high estimation as febrifuges and intermittents. The baobab tree belongs to the natural order Malvaceæ. From it M. Martin has extracted an alkaloid, which he names *Adansonine*, and thinks that the peculiar medicinal properties of the tree are due to the presence of this substance. M. Martin states that Adansonine is an efficient substitute for quinine, though it exists in the bark of the baobab tree in too small proportion to admit of profitable extraction.

Koussin.—Dr. Bedall‡ recommends the employment of this, the active principle of kousso, in preference to the crude drug. Panesi, who first prepared koussin or tæniin, fell into the error of supposing that it is found only in the pollen of the plant; but Bedall, by a process similar to that employed for the extraction of santonin, has obtained it not only from the pollen, but also in abundance from the stalks

* 'Pharm. Journ.,' viii, p. 595. † 'Bull. Gén. de Thér.,' lxxii, p. 360.
‡ 'Bayer ärztl. Intel. Bl.,' 1867, No. 4; 'Schmidt's Jahrb.,' 134, p. 17.

and flowers. The flowers are exhausted with boiling alcohol and lime, the spirit is distilled off, and the resin precipitated by acetic acid, washed, and dried. As thus obtained, koussin is a white or yellowish white, very friable, odourless, crystalline resin. It is very slightly soluble in water, readily soluble in absolute alcohol and in alcohol of 90 per cent. It is almost tasteless at first, but leaves a sharp, bitter after-taste. Three per cent. of koussin may be extracted from the flowers. It was administered in five cases of tapeworm, in several of which other remedies had been ineffectually employed. In all cases the worm was expelled after pain in the abdomen, purgation, and sometimes vomiting. In only one case was it necessary to repeat the dose. To an adult 20 or even 40 grains may be given, enveloped in wafer-paper.

The physiological and therapeutical actions of a great number of plants and of their active principles have been investigated of late. The following notes embody the principal results obtained:

Bromide of Potassium.—MM. Eulenberg and Guttmann,* from their own experiments, come to the conclusion that this salt exerts a paralysing effect on the heart and nervous centres. M. Laborde† arrives at a totally different conclusion. This experimenter states that the bromide acts neither upon the heart as a poison, nor does it paralyse either the muscles or the encephalon. Its primary action, he says, is upon the spinal cord, and results in the impairment or destruction in this nervous centre of the property of presiding over reflex movements. The rationale of the action of bromide of potassium is still an open question.

Dr. Bill‡ rejects the conclusions of all these observers, and, whilst recognising the usefulness of the bromide in diminishing the sensibility of the mucous membranes, attributes the hypnotic effects observed after the continued use of the salt to an accumulation of carbonic acid in the blood. Bromide of potassium is, in its legitimate action, an anæsthetic to the nerves supplying the mucous membranes, and a depressor of the action of these. The beneficial effects resulting from the administration of the salt in epilepsy are attributable to this anæsthetic action when the disease has an eccentric origin. Bromide of sodium has not the same action as bromide of potassium, but is the physiological substitute of chloride of sodium; hence common salt is a direct antidote to bromide of potassium, the two salts yielding by double decomposition bromide of sodium and chloride of potassium.

Carbolic Acid.—Dr. Neumann§ has investigated the action of this substance on organic tissues, and embodies his results in the following conclusions:—(1) Carbolic acid, when concentrated, is a powerful caustic, the action of which is not confined to the spot where the acid is applied; hence its deep penetration into the skin. (2) It renders the tissues transparent without swelling. (3) After intense action of the

* 'Gaz. des Hôp.,' 1867, No. 77. † Ibid., 1867, No. 83.
‡ 'Amer. Journ. of Med. Sc.,' lvi, p. 17.
§ 'Wiener Med. Wchnschr.,' 1867, No. 35.

acid the individual tissue-elements can still be distinctly recognised in the eschar. (4) Its action results rather in a mummification than in a destruction of the tissues. (5) Not only does carbolic acid act beneficially upon such skin diseases generally as are treated with tar, as, for instance, eczema, but also upon lupoid ulcerations.

Male-fern.—Carblom* has investigated the action of several of the chemically pure constituents of the ethereal extract of this plant, viz. filicic acid, the fixed oil, and an indifferent body of a resinous nature which exists in the oil, and can be extracted from this by repeatedly boiling with alcohol, as a greyish-brown powder. The experiments were made on cats afflicted with tæniæ, and upon men suffering from the bothriocephalus, the presence of the parasites being established by finding the ova of the parasites in the fæces. The oil and the indifferent body were proved to be equally inert, even in large doses, so that the active principle of the plant would appear to be filicic acid. Given alone, this acid causes abundant loose stools, and expels (not constantly, however) fragments of the worm. Given in conjunction with sulphate of magnesia or sulphate of soda in large doses, filicic acid is inert, whilst when taken in castor oil the worm was completely expelled in three out of four cases. As, moreover, the acid is inert when given in olive oil, as it is also when given in Seidlitz powders, the alkali of which dissolves filicic acid, Carblom concludes that it is the drastic effects of the castor oil, and not the solubility of the acid in this medium, that causes the favorable results when the oil is used as a vehicle for the administration of the medicament.

Dr. da Costa† gives the results of the administration of narcein in disease. He sums up his conclusions thus:—(1) Narcein acts little, or, at all events, much less than morphia, on the activity of the skin. (2) As a rule, the use of narcein produces neither headache, nausea, nor constipation. Headache and nausea are, however, sometimes observed in women. (3) Narcein causes no excitement; now and then the face is flushed; the pupils are unchanged. (4) The pulse, respiration, and temperature are not affected. (5) Narcein lessens the desire to micturate rather than diminishes the quantity of urine secreted. (6) In doses in which morphia allays pain and procures sleep with certainty, narcein does neither; in very large doses (2·3 gr.) it shows itself to be an uncertain remedy in both these respects. It is also unsuited for hypodermic injection on account of the local irritation it produces. The narcein employed was chemically pure, and was obtained from various sources.

Digitalis.—Legroux‡ has investigated anew the action of this substance, and summarises his conclusions thus:—(1) Digitalis, the active principle of which is digitalin, exercises, in all doses, a special action on the circulation. (2) If given in poisonous doses, digitalis acts directly on the heart; in therapeutic doses it appears to excite primarily the contractility of the capillary vessels, and to influence the circulatory centre only secondarily by re-establishing the equilibrium of the circu-

* Virchow and Hirsch's 'Jahresber.,' 1867, i, p. 468.
† 'Pennsylvania Hosp. Rep.,' 1868, i, p. 177.
‡ 'Gaz. Hebd.,' 1867, pp. 113, 133, 164.

lation. (3) If this theory be adopted, digitalis is a sedative of the circulation, in the sense that it calms its disordered actions; but this is by an excitant and tonic action, and not, as is generally supposed, by one which is hypothenisant. (4) The influence of digitalis upon the temperature, nutrition, uterine contractions, and hæmorrhages, can only be explained by its excitant action on the terminals of the great sympathetic. (5) This theory fully justifies the favorable results obtained by the use of digitalis in fevers, cerebral affections, hæmorrhages, dysmenorrhœa, congestions, dropsies, and those disturbances of the circulation dependent on cardiac lesions.

Veratrum.—Oulmont has investigated the effects of the tincture of *Veratrum viride* on animals and on man.* He found the effects manifested chiefly on the digestive, respiratory, and circulatory organs. Nausea was quickly produced, followed by violent vomiting and purging, sometimes lasting from 15 to 20 hours. No inflammation of the alimentary canal was found after death. The same effects resulted from hypodermic injection of the drug. The respiration was very rapidly and strikingly altered; it became unequal and irregular—now very rapid, and again so slow that only one or two respirations occurred in a minute; and occasionally, in frogs, it entirely ceased. The circulation slackened just as quickly; the pulse fell 20, 40, or 60 beats per minute (in men, free from fever, with doses of from 1 to 3 cubic centim. = 15 to 46 minims, it fell 30 or 40 beats). Lowering of temperature is less constant; but in ½ to 2 hours 2, 3, or 5 centigrade degrees of heat (3½, 5½, or 9 degrees F.) may be lost. A hypothenisant action is manifest from the outset; enfeeblement and prostration go on till they culminate in death. Convulsions, rigidity of the muscles, and tetanus never occur. The fatal dose of the tincture is, for a frog, 20 drops; for a rabbit, 60 to 80 drops; for a dog, 120 to 150 drops.

Oulmont likewise made comparative experiments with *Veratrum album*, to determine whether the two plants possess similar properties. The *V. album* produces a more rapid action than the *V. viride*, and is fatal in half the dose. Inflammation of the alimentary canal is invariably found after death from the former. In other respects the two species appear to possess similar properties. *Veratrum viride* is consequently a safer remedy than *V. album*. The effects observed do not appear to be due to the veratria contained in *V. viride*, for a specimen from which all the alkaloid had been removed was just as active as before. Oulmont concludes that *V. viride* is a cardiac poison, like digitalis, but is quicker in its action.

Prevost† has investigated the physiological effects of veratria. After proving that the effects upon the ruddy frog (*Rana temporaria*) differ from those produced on the green frog (*R. viridis*), he divides the symptoms into three periods—(1) A stage of excitement. (2) A stage of tetanic convulsions, produced either spontaneously or on irritation. (3) A stage of resolution and almost complete loss of muscular excitability, during which the pulsations of the sanguineous and lymphatic hearts and the respiratory movements, which had been diminished

* 'Bull. Gén. de Thér.,' lxxiv, p. 145.

† 'Comp. Rend. de la Soc. de Biologie,' iii, p. 133.

during the second stage, become considerably enfeebled. Very curiously, if less than a fatal dose have been given, the animal exhibits a reverse order of symptoms, as has been observed after the administration of strychnia and curare. This return of symptoms is, in frogs, independent of the circulation. The heart slackens its pulsations, and even stops, more quickly in the ruddy than in the green frog; and it is quite exceptional for the heart to cease beating in the latter animal. The lymphatic hearts are more susceptible to the action of veratria than the systemic heart; and when this latter ceases to beat it stops with the ventricle in the contracted condition. Veratria appears to produce no direct action on the brain, spinal cord, or nerves. It appears to produce a direct action on the muscles; these contract on direct excitation when the nerves supplying them are severed from the cord and irritated, and again by reflex action through the cord. Though strychnia and veratria both produce tetanus, there is a profound difference between the two poisons, for veratria diminishes sensibility. Prevost has been unable, however, to determine whether this is caused by an action on the nerves of sensation or on the cord. The phenomena exhibited lead him to conclude that the administration of veratria may be detected in forensic practice. Finally, veratria has a special action not exhibited by any other poison; it modifies muscular contractility, whereas these abolish and destroy without modifying contractility.

Dr. P. Guttmann* has likewise experimented with veratria with the especial object of determining the effects of the alkaloids on the muscles. As his results have chiefly a physiological interest, we forbear from a detailed account of them in our limited pages.

Cinchona Barks and Alkaloids.—The Madras and the Bombay Cinchona Commissioners have respectively issued their preliminary reports on the febrifugal value of cinchona alkaloids other than quinine. The alkaloids used were quinidine, cinchonine, and cinchonidine, all being furnished as sulphates in a pure state by Messrs. Howard. The main conclusion of the Madras Commission is that the alkaloids hitherto but little valued in medicine are scarcely, if at all, inferior as therapeutic agents to quinine. The Bombay Commissioners report that the cinchona alkaloids are febrifuges, antiperiodics, and tonics, their general effects being similar to those of quinine, though, perhaps, in an inferior degree. They are very efficacious in the treatment of the common fever of the country, hemicrania, disordered digestion, &c. The relative value of the alkaloids in the order of their efficacy appears to be quinine, quinidine, and cinchonidine and cinchonine about equal. As variously estimated, the three latter alkaloids possess the same therapeutic properties as quinine to the extent of from one half to two thirds.

Mr. Broughton, in reporting to the Indian Government on the cinchona grown on the Neilgherry Hills, speaks very favorably of the yield of alkaloids from the different kinds of bark grown in the Govern-

* 'Arch. f. Anat. u. Phys.,' iv, p. 494.

ment plantations and the per-centage of *crystallizable* sulphate of quinine that may be extracted from them. He states that more crystallizable sulphate is obtained from them than from good specimens of South American bark. The good results of the employment of Mr. McIvor's plan of protecting the bark from sunlight, by means of a covering of moss during the growth of the tree, is dwelt upon; and the extraction of the alkaloids from the green in preference to the dried bark is also recommended, since quinine is much more readily extracted from the green than from the dried bark.

False Cinchona Bark of India.—Mr. Broughton* has recently examined this drug, the bark of the *Hymenodictyon excelsum*, formerly known as *Cinchona excelsa*, a tree very closely resembling in appearance the *Cinchona Peruviana*. He finds the bitterness of the plant to be caused by the presence of esculin, the bitter principle of the horse-chestnut. It is singular that this latter tree should itself contain quinovine, the bitter principle of the leaves of the cinchonas, and also found in their bark. The false cinchona bark of India contains no quinine, and the expectations once entertained of its medicinal value have little support in fact. It loses its bitterness on drying, and this is accounted for thus—esculin by contact with organic substances in a state of change becomes slowly converted into a much less bitter neutral body, esculetin and glucose.

Coniin.—Werigo† has investigated the action of this alkaloid. He concludes that coniin acts most decidedly upon the spinal cord, and especially upon its motor part; and this is shown in frogs by paralytic symptoms appearing without a trace of convulsions; in mammals, when given in large doses, by the production of violent convulsions, and in small doses by paralysis of the extremities. The brain and nerves of sensation appear to be unaffected. In small doses coniin retards respiration, a consequence of the action on the spinal cord. Convulsions are infallible signs of impending death. No perceptible change is produced in the blood. Neither the beats of the heart nor those of the arteries are altered, but the heat of the surface of the body is diminished. Coniin does not appear to act on the pupil with constancy. Its action is much more powerful when injected into the veins than when injected subcutaneously. The secretion of urine is unaffected. Nothing of importance is observable on post-mortem section.

Dr. John Harley, in his Gulstonian lectures,‡ states that the action of conium is confined to the motor centres, and results in temporary depression of the functional activity of the corpora striata, the minor centres of motion, and the whole reflex function of the spinal cord. He compares the tranquillising effects which this drug exerts over these excited nervous centres with the influence of opium on an over-excited brain. If the patient is walking about after taking conium, the first effect noticed will be a heavy dragging sensation in the legs, with distinct

* 'Pharm. Journ.,' ix, p. 418.

† 'Schmidt's Jahrb.,' 135, p. 141; trans. from 'St. Petersburg Archiv. f. Gerichtl. Med.'

‡ 'Pharm. Journ.,' ix, pp. 53, 471.

impairment of motor power. In addition to the above symptoms there was, after the injection of three fluid drachms of the Succus Conii, B. P., a want of adaptation of the eye. For fixed objects the sight was good, but not for bodies in motion. These effects disappeared in the course of an hour. If five or six fluid drachms of the succus be taken, more marked symptoms supervene; there is great lethargy, giddiness, hazy vision, disinclination towards muscular exertion, and dropping of the eyelids. The speediness of accession of these symptoms varies with the dose. To a man, æt. 57, a fluid ounce was given, but the giddiness and weakness came on so rapidly that he would have fallen had not assistance been rendered. In about two hours the man had quite recovered the use of his limbs. The action of hemlock is uniform and invariable in man, but it must be given in such doses as will produce a distinct physiological effect, and this effect is proportioned, not to the muscular strength, but to the motor activity of the individual; thus, those who lead a sedentary life are more affected than those of active habits, and a restless child will take, without appreciable effect, a dose of conium sufficient to paralyse an adult of indolent habits. One of the earliest indications of the action of the drug is paralysis of the third nerve, consequently ptosis and dilated pupils; its last effect is complete obliteration of all muscular movement derived from the cerebro-spinal motor tract. In many hundred experiments no pure cerebral effects have been noticed. The urine is unaffected even when large doses have been given, nor can conia be detected in this or in any other excretion. With regard to the use of conium in disease, great stress is laid on the proposition "That a dose of hemlock, which falls far short of producing its peculiar physiological effects, is of no more use than an ordinary dose of quinine in the treatment of ague." In tetanus, chorea, epilepsy, spasmodic affections of the stomach or œsophagus, and muscular tremor, hemlock has produced very valuable effects. Dr. Harley finds most of the preparations of conium to be inert. The only preparation which retains the active principle of the drug in sufficient quantity is the *succus*, and this, possessing the full activity of the plant, is a most valuable medicine. The dose for an adult is from ℥iss. to ℥j., according to the *activity* of the individual. A *succus* prepared from the root of *Conium maculatum* was almost inert.

Belladonna.—Dr. Harley* also investigated this drug, and found that the effects of a "Succus Belladonna," prepared by a method similar to that which is used in making the Succus Conii, B. P., were precisely similar to those of sulphate of atropia; 30 minims of the "succus" being equal to $\frac{1}{20}$ grain of that salt. The effect was the same whether it was administered by the mouth into the stomach or when injected beneath the skin, the only difference being in the rapidity of its action. Given by the skin, the effects are developed in a quarter of an hour or less; given by the mouth, the operation is not fully manifested for half or three quarters of an hour, and sometimes later. These effects are, when the drug is given in small doses, increased frequency of the pulse, transient giddiness, dryness of the mouth, and dilatation of the pupil; sometimes

* Loc. cit.

there is delirium. In two or three hours the effect passes off. The kidneys seem to be the active agents in eliminating the alkaloid from the system, for this may be found in the urine eighteen minutes after the injection of $\frac{1}{48}$ of a grain of sulphate of atropia, and it is generally entirely removed at the end of two or three hours. To the toxicologist this elimination of the alkaloid by the urine is of great importance, as it is readily demonstrated. If on applying a few drops of the urine to the eye of a kitten or rabbit, dilatation of the pupil is produced, this points directly to one or two plants; and it is possible to detect the alkaloid in the urine when only $\frac{1}{96}$ of a grain is given. This is probably the least quantity that can destroy a new-born child. With regard to the therapeutical uses of belladonna, Dr. Harley shows that it must be looked upon as a diuretic and a most hopeful remedy in cases of suppression of urine, accompanied or not by uræmic symptoms, the dose being $\frac{1}{48}$ gr. of sulphate of atropia, subcutaneously injected; as a means for increasing the oxidizing process within the body, in similar doses; and as a cardiac stimulant, and for this purpose $\frac{1}{100}$ gr. is sufficient. No medicine in the whole materia medica can directly and immediately increase the force and rapidity of the heart's action to one fourth the degree that belladonna is capable of doing; hence its great value in the collapse of cholera, in syncope from asthenia, and in cases where there is great loss of blood. Certain conditions interfere with the action of belladonna upon the system. Thus, children are less susceptible than adults, and occasionally bear very large doses. The fixed caustic alkalies, caustic ammonia, and lime, decompose the active principle of belladonna, though not till after the lapse of some time.

Hyoscyamus.—This medicament also received investigation from the same observer,* a sulphate of hyoscyamia, prepared by Dr. Harley, being used. It is questionable whether, however, this was a pure substance, as it was brown and imperfectly crystalline. Injected subcutaneously, the salt caused at first slight increase in the frequency and power of the pulse, then a considerable decrease of frequency, unaccompanied by any alteration in volume or power, giddiness, sleepiness, and dilatation of the pupil; in some cases slight twitchings, dryness of the mouth and air-passages, and delirium. When hyoscyamus, or its active principle, is absorbed by the alimentary mucous membrane, precisely similar effects follow, and the action is usually manifested within an hour. A "Succus Hyoscyami" was prepared analogous to the "Succus Conii," and it produced symptoms of equal intensity to those of the alkaloid. Three ounces of the "succus" produced symptoms equal in intensity to those mentioned above. In the adult from ʒvj to ʒj of the tincture, or 10 to 15 gr. of the fresh extract, are usually sufficient to produce decided dryness of the roof of the mouth, acceleration of the pulse, dilated pupil, and a moderate degree of somnolency. Children will often take a very large quantity of henbane; doses varying from ʒij to ʒj of the juice and tincture have been given continuously to young patients without producing any dryness of the mouth or any other symptom beyond increased frequency of the pulse and dilatation of the pupils. In its action upon

* Loc. cit.

the system henbane appears to be intermediate between opium and belladonna, possessing, as it does, on the one hand, somniferous properties second only to opium itself, and, on the other hand, having an influence upon the sympathetic nervous system, as indicated by the pulse, second only to that produced by belladonna; although, like opium in some respects, its influence upon the pulse, pupils, and mucous membrane of the mouth, places it in strong contrast with that drug; and, on comparing it with belladonna, its deliriant or somniferous properties are found to preponderate. Like atropia, hyoscyamia has been found in the urine twenty-two minutes after the subcutaneous injection of $\frac{1}{15}$ of a grain of this alkaloid, and two hours and a half after ʒij of the "succus" were taken into the stomach.

Ludwig* has recently obtained hyoscyamia in a crystalline state. Tilden† has done the same. In connection with Dr. Harley's conclusions we may note that Delioux de Savignac has investigated the action of belladonna,‡ and states that it invariably acts as an excitant, and that its benumbing effects are ouly observed when it is given in large doses—*i. e.* when paralysis is immiuent. Hence, as a poison, this drug is a stupefacient; as a medicament, an excitant. Through its stimulating action on the sympathetic, and the organs supplied by this nerve, it is an anodyne and antispasmodic. It assists defæcation by its action on the muscular coat of the intestines, by stimulation of the *ductus choledochus* it aids the passage of gall-stones, and is especially useful in the so-called colic produced by those concretions. But the chief action of belladonna is upon the sphincters. It does not expend itself upon the dilators alone, as is often wrongly assumed, but acts also upon the constrictors; were it not so, incontinence and not retention of urine would be observed from its administration. The activity of belladonna in rigidity of the os uteri, and the striking results of its external application in morbidly excited states of the circulation and irregularity of the heart's action are, according to this observer, to be referred to its stimulating effect on the muscular system.

Belladonna also produces soothing and resolvent effects; for example, friction with belladonna ointment in rheumatism affords the double advantage of soothing the pain and abating the swelling of the inflamed joints. The same is observed when this ointment is applied to enlarged glands. This preparation, applied to open wounds, causes gentle smarting; but here its effect is quite different from that of epispastics and suppurants, for belladonna causes rapid healing of wounds and the formation of epithelium. In accordance with this, dryness of the buccal and pharyngeal mucous membranes are the result of the internal administration of this medicament. The good results of the use of belladonna in asthma are to be attributed to the restoration of the disturbed contractility of the smaller bronchi.

Caffein.—Dr. M. Leven § draws from his experiments with this substance the following conclusions:—Caffein directly stimulates the heart. When first absorbed, the circulation and respiration are accelerated,

* 'Arch. Pharm.,' cxxvii, p. 102. † 'Pharm. Journ.,' viii, p. 127.
‡ 'Bull. de Thér.,' cxxiii, p. 433.
§ 'Arch. de Phys. Norm. et Path.,' Jan., Feb., 1868.

the pulse is more frequent and firmer, and the secretions are more active. The central nervous system, brain, spinal cord, and nerves, are stimulated. The muscular system of the life of relation and that of organic life contract violently. The muscles of the former system are affected with trembling or with general contraction. The fibres of the stomach, of the intestines, and of the bladder, also contract. At a later period, after absorption of caffein, the action of the heart is lessened, the frequency and firmness of the pulse diminished; the muscular system becomes exhausted, but is not paralysed. The nervous system also suffers exhaustion. Caffein does not entirely extinguish reflex action, nor the function of the nerves and muscles. It acts as a poison on different animals in different doses; it may be given to man in the dose of many grammes without injury. It is readily eliminated from the system, and remains in it only a few hours. Leven further states that caffein, like alcohol, diminishes the secretion of urea, but increases the excretion of urine. It diminishes the waste of the organs, and economises the tissues.

Théin.—Dr. Leven has also compared the effects of théin from tea with those of caffein from coffee.* Chemical analysis reveals no difference between these crystallizable nitrogenous principles. On experimenting upon frogs and guinea-pigs Dr. Leven came to the following conclusions:—(1) Théin and caffein, though considered to be one and the same alkaloid by chemists, seem to produce different toxic effects on animals submitted to their action. (2) Théin is a less active poison than caffein, and it is only when given in double doses that the former produces the toxic effects of the latter. (3) Théin also produces convulsive movements of the limbs, an effect not observed with caffein. (4) In other respects their physiological effects are identical. Both alkaloids seem to directly excite the heart and respiratory movements, and to increase arterial tension. By exciting the circulation they stimulate the central nervous system, the brain, and spinal cord; but they do not arrest the functions of the spinal cord and nerves. The tetanic convulsions resulting from their action is caused by stimulation of the spinal cord. They do not abolish the functions of muscles, and the heart does not cease to beat immediately after death.

Opium Alkaloids.—The 'Medical Times and Gazette'† furnishes an interesting account of the discussion raised by Dr. Baxt, of St. Petersburg, at the Annual Congress of German Naturalists at Frankfort, in 1867. Baxt thinks that thebaine is a poison analogous to strychnine, whilst papaverine possesses pure hypnotic properties. Köhler doubts the analogy between the effects of thebaine and strychnine, and states that all the opium alkaloids cause tetanus when administered to the lower animals.

* 'Arch. de Phys. Norm. et Path.,' May, June, 1868. † Vol. ii, 1867, p. 683.

REPORT ON PUBLIC HEALTH.

BY

THOMAS STEVENSON, M.D.

Cholera.

M. Fauvel, in a work on this disease, and again in a *résumé* of his views,* gives an interesting and instructive account of the labours of the International Cholera Conference at Constantinople in 1866. The conference adopted the view that cholera is an exotic pestilential disease of Indian origin, and adopted the germ hypothesis of its propagation, *i. e.* they appear to have been pure contagionists. M. Fauvel rejects the idea that the disease has its origin in marshy effluvia, seeing that intermittents and cholera run simultaneously perfectly distinct courses, side by side, in the same locality; and that it is probable that in India, as elsewhere, the cholera germs have their origin within the human body. No case has been established where the disease could not possibly have, and probably had, been propagated by direct contagion. But it is doubtful whether Pettenkofer's and Thiersch's view ought to be received —that the excreta must undergo a certain degree of fermentation before their poisonous activity can be developed, though it is certain that the excreta are the channel through which the disease is transmitted from one human being to another.

In the majority of cases the air becomes the vehicle of transmission of the cholera germs, and these are received into the lungs, though their reception through the digestive organs is not entirely excluded. Nevertheless, the germs appear to be destroyed by free contact with air, and so the disease is never propagated to a distance by this medium. Hence, also, cholera imported into a district does not necessarily spread. The cessation of a cholera epidemic proceeds from two causes—the resistance offered to its transmission by the surviving individuals, and the more or less rapid extinction of the morbific germs.

The conference insists strongly on naval hygiène—the choice of anchorage, the good supply of food and drink, the use of disinfectants, seclusion of the sick and the immediate casting of their dejections into the sea, &c. In the use of disinfectants two objects are to be secured—the destruction of the germs, and, at the same time, the preservation of clothes and other perishable articles by the use of such disinfecting

* 'Ann. d'Hyg.,' xxx, p. 5.

agents as do not act injuriously upon the latter. The securing of both these conditions prevents the use of many otherwise most valuable disinfectants. The conference has not resolved this most difficult problem.

The conference divided the consideration of measures of quarantine into three heads—the degree of utility of quarantine measures, quarantine proper, and the quarantinary régime applicable to the productions of cholera-infected countries. Considerable differences of opinion seem to have been held by the members of the conference. The members were, however, of opinion that the presence or absence of a clean bill of health on a ship's arrival in port ought to be the criterion as to whether quarantine *de rigueur*, as the French term it, should or should not be enforced; whilst in cases where a clean bill of health is forthcoming in times of cholera epidemic a simple quarantine "of observation" should be enforced. Having determined that the period of incubation of cholera is very short—usually a few days, and rarely exceeding a week—they fixed ten days as the period to which quarantine ought to extend, the period to commence from the arrival of the ship in port. Many exceptions were made, however, to this rule. When a vessel arrives in port from an infected place with an unclean bill of health, she must be subjected to quarantine *de rigueur, i.e.*, the vessel must discharge her cargo, be disinfected, and the crew and passengers are to be placed in a lazar-house. The conference expressed a wish that henceforth the term "sporadic" cholera should be discontinued. Its use gives rise to an ambiguity, for it may mean that the cases are isolated ones of genuine Asiatic cholera, or that they are severe cases of non-epidemic English cholera.

In respect to measures having for their object the prevention of new invasions of cholera into Europe, the conference considered, firstly, prophylactic measures in India; and, secondly, prophylactic measures in the countries intermediate between India and Europe. Under the first head they recommend the vigorous carrying out the "Native Passenger Act," the delivery to every vessel leaving an Indian port of a bill of health, and the superintendence, by proper sanitary authorities, of the regulations relative to the embarkation of pilgrims, and that each Mussulman pilgrim be required to prove that he can bear the expense of the voyage and the support of his family during his absence. The British Government has already legislated in accordance with the latter wish of the conference.

The routes by which cholera has invaded Europe in the epidemics of 1830, 1847, and 1865, are considered in M. Fauvel's memoir, and the prophylactic means to be adopted in the countries intervening betwixt India and Europe. The visitation of 1853 is not regarded as a distinct invasion, but as a part of the epidemic of 1847, which, having left foci here and there, and visited America, was reimported into Spain from Havanah, whence it spread into France, England, and the East. Persia is of all countries the most exposed to invasions of the disease; and once there, cholera radiates from the populous centres by means of the caravans of pilgrims or of merchants. But the malady does not seriously menace Europe except when it has reached the south

coast of the Caspian Sea. It is thence that three epidemics have penetrated Europe, or nearly so, by terrestrial agencies; the first to become extinguished, in 1823, at Astrachan, on the Caspian Sea; the two others to be propagated. When once cholera has reached Recht, an important commercial town, it has been constantly observed, in the three instances we are speaking of, to pass along the shore of the Caspian Sea, reach the maritime town of Lenkoran, and then invade the delta of Kour and the town of Salian, situated near the mouth of this river. Having arrived at this point, the two most recent epidemics have bifurcated; on the one side passing up the valley of Kour, invading the Transcaucasian provinces, and traversing them to the Black Sea; on the other, keeping the direction of the shore towards the north, gaining Bakou, attacking Astrachan, and from thence passing into Europe. The averted attack of 1823 took this latter course alone. This, then, is the only dangerous route for the importation of cholera into Europe by land. In all the other directions in which the disease radiates from Persia it is stopped by the natural barriers of the country. The epidemic of 1865 reached us by a new and much shorter way, by the maritime route of the Red Sea. Since cholera is abundantly exported from India by sea, those countries which are most directly in communication with India are subject to frequent visitations of the disease, whilst more distant countries are exposed in proportion to their remoteness and the facilities of communication between them and India. Formerly, when pilgrims to Mecca returned to Egypt by caravans, the cholera which they might have contracted in Mecca died out before they reached Egypt; but now, when the facilities offered by steam navigation induce pilgrims to adopt the quicker sea route, the disease is more readily imported into Egypt. It was in this way that the epidemic of 1865 reached that country and thence passed into Europe. Seeing, then, that the most available route for the importation of cholera is by the Red Sea, the conference came to the conclusion that strict measures of quarantine, sanitary supervision of vessels at the straits of Bab-el-Mandeb, and the establishment of an international authority charged with the carrying out of these measures on the island of Perim, which commands these straits, would be the surest means of checking the progress of the disease. Since the sitting of the conference an exploration of the straits and adjacent coasts by the Ottoman Government has confirmed this view. Political considerations prevented the conference from adopting views which they would have otherwise done, but they advise the quarantine stations to be placed on the Arabian side of the Red Sea, and take especial care to protect Suez as much as possible from the possibility of infection. It was laid down by the conference as a fundamental rule that, in the event of an outbreak of cholera among the pilgrims, all maritime communication ought to be suspended between the Arabian and Egyptian sea-ports; but out of deference to the Ottoman Government this rule was relaxed, and pilgrims are to embark for El-Wesch, a place on the north of the Arabian Red Sea coast, and there to undergo quarantine before landing in Egypt. In the event of an outbreak of cholera in Egypt the conference, after much animated debating, resolved that it will be

expedient to suspend all communication between Egypt and the Mediterranean ports, notwithstanding the inconveniences that must necessarily ensue to commerce from the carrying out of such a measure. After insisting on the measures to be taken in Persia for preventing importation of the disease into Europe overland—measures which the Persian Government has appointed a sanitary commission to take into consideration—the necessity of enforcing the defensive line already constituted on the Black Sea by Turkey, the sufficiency of the natural Russian frontier on the side of Bokhara, and the stringent preventive steps required in the Russo-Persian frontier, especially in the neighbourhood of the delta of Kour, were laid down.

M. Fauvel gives also an interesting sketch of the progress of cholera since the close of the labours of the conference in September, 1866, and of the carrying out of the prophylactic measures recommended by that body. After sketching the course pursued by the epidemic in 1865,* he states that in 1867 the disease was then not yet extinguished in Europe, but that, whilst it still kept hold of some of its old foci, and even new ones were formed in parts which had previously been spared, cholera broke out with severity in North Africa, whilst in France it was confined to Bretagne. In 1868 it had died out in Europe before the month of May; and though a few of the old centres have since lighted up their hidden fires, but little has been heard of it during the last summer. Imported into Guadaloupe in October, 1865, cholera raged throughout the Antilles, whence it spread to the continent. Cuba and St. Thomas's suffered very severely, whilst, thanks to a rigid quarantine, Martinique escaped. Though a case of cholera appeared in New York, November 3rd, 1865, in a vessel from London viâ Hâvre, the disease did not then spread; but in 1866 English emigrants imported it into Halifax, whence it speedily extended to New York and beyond. In 1867 the epidemic spread over the coasts of North America, and in the same year it spread from the Antilles to the east coast of South America. It appeared in Brazil and even at La Plata; at Montevideo and Buenos Ayres, whence, ascending the river, it attacked the belligerents in Paraguay and committed great ravages. In February, 1868, the epidemic was not extinct in Buenos Ayres. It remains to be seen whether the disease will be reimported into Europe from the west, as it was in 1854, into Spain from Havana.

Returning to the spread of the outbreak in 1865, the disease, besides its irruption into Europe, returned eastward by two chief routes—by the Persian Gulf, Chatt-el-Arab, Bassorah, Kerbellah, and Bagdad; and by Syria, Aleppo, and along the banks of the Euphrates and Tigris. The point of junction of the two streams of pilgrims travelling in these directions was at Kerbellah, a sacred place to the Persians. The Syrian current sent out a branch towards Diarbekir, which penetrated directly eastward into Kurdistan and into Persia by Khoï-Sandjak. Even towards the middle of 1866 the disease remained confined to the valleys of Kurdistan and to the Turkish valleys of the province of Bagdad which abut on the Persian frontier. It then penetrated the country, appearing in the province of Ourmia and reached Tauris.

* *Vide* this 'Retrospect,' 1865–6, p. 492.

During the succeeding winter the epidemic abated only to invade Persia in 1867, which it traversed from west to east, becoming entirely extinct in the succeeding winter.

Two pilgrimages have taken place since the sitting of the conference in 1866, and no outbreak of cholera has appeared during either. This confirms the opinion of that body that the disease is not endemic in Mecca. Owing to the increased stringency of the regulations for ships carrying pilgrims from India the number of those proceeding by sea has decreased, and no cholera has appeared among them; on the other hand, the number of pilgrims travelling overland across Arabia has much increased. The Turkish Government has carried out the recommendations of the conference most admirably under a mixed sanitary commission of Mussulman and Christian doctors. Suffice it to state that Mecca and Djeddah (the latter the chief port of embarkation for pilgrims) have undergone a complete sanitary revolution; quays, sewers, slaughter-houses, tents, lodgings, and a hospital, have been erected; and the streets of Mecca are regularly swept and watered thrice a day. The sacrifices, too, are placed under the control of the commission. It is to be regretted that the same praise cannot be awarded to the Egyptian Government; they have made regulations for the transport of pilgrims, it is true, but they have not made any attempt to put them into execution.

The 'Ninth Report of the Medical Officer of the Privy Council' is one of peculiar interest, since it deals with the large question of cholera, more especially with reference to the outbreak of 1866. The disease appeared for the first time that year on the 28th of April, at Bristol, in a trader who had arrived there sick from Rotterdam. On May 15th the disease was prevalent among German and Dutch emigrants, who, with a view of crossing the Atlantic for New York, had come in flocks, travelling rapidly from the Continent, often from infected parts of it, by way of Hull, Grimsby, and other of our north-eastern ports, and had now fallen ill at their port of embarkation. A few days after the 15th two cases occurred in Swansea, the first of what afterwards became a serious outbreak, and single cases occurred in various parts of the country. On June 15th the Peninsular and Oriental Company's steam ship Poonah arrived at Southampton with a case of cholera on board, and several other cases appeared in the town. On the 29th two deaths were reported at Goole, the disease having clearly been imported from Antwerp. On the 30th three deaths were reported to have occurred at Northwich, in Cheshire, and on the same day a case of cholera occurred at Shields, on board a vessel from Hamburg. On July 3rd a case occurred at Harwich, on board a vessel from Brussels, and on the same day the death of the captain of a coasting vessel was reported from Brixham. The "Diseases Prevention Act" was now put in force throughout the whole of England and Wales, with a view to stopping the spread of the disease. On July 18th the first cholera death in the metropolis was reported from Poplar, and two days later it was known that there was already an alarming proportion of cholera cases in parts of East London. Details of this well-known outbreak are given in sub-reports.

In a postscript Mr. Simon touches upon the chief topics discussed at the cholera conference held at Weimar, at Easter, 1867. At this conference the doctrine for which Pettenkofer has long contended, that the "caprices" of cholera, as to its places and times of prevalence, have their respective roots in different qualities and different states of local soil, was illustrated by many examples. One such, as to places, was a geological map of Thuringia, with the epidemics of 1866 marked upon it, where at a glance it was seen that the epidemics in that large and varied area had been almost exclusively on one geological formation. And equally striking in the same sense were some illustrations on a smaller scale showing extremely definite boundaries of non-prevalent or minor prevalence of cholera, coincident with equally abrupt distinctions of local soil. Similarly as to "time caprices" of the disease, facts of considerable interest were adduced in support of Pettenkofer's view, that the different behaviour of cholera at different times in the same place is determined by temporary differences of soil, *i. e.* by variations in different seasons in the thickness of superficial porous soil, which is left unoccupied by "subsoil-water" and consequently penetrable by air, variations which in many cases can be inferred from the varying water-level of the surface-wells. A very striking set of reports related to some supposed successes, and some unquestionable non-successes, of chemical disinfection, where it had been used in the hope of preventing or arresting epidemics of cholera. The very remarkable account which Dr. Wm. Budd, of Bristol, has published,* and which must be familiar to our readers, of the almost entire exemption of that place from cholera in 1866, under a system of disinfection which the medical officer, Mr. Davies, had applied with singular assiduity and completeness. On the other hand, in Leipzig, Prof. Victor Carus had the town divided into 100 disinfection districts, each with an officer who visited daily for disinfection with sulphate of iron every house in his district; over these district officers were four young chemists, constantly inspecting, under Dr. Carus's instructions, to see that all disinfection was satisfactory; and Prof. Carus himself, besides superintending all this work personally, every day visited all houses which had cholera in them. Disinfection had never before been tried in Leipzig, yet never had Leipzig suffered so severely from cholera. In Stettin, all choleraic discharges were treated with lime and chloride of lime; but in all the 13 cholera epidemics of the town never had the disease been so severe. In Erfurt carbolic acid was used so lavishly that the very drinking-water reeked and tasted of it; testifying, by-the-bye, to a dangerous proximity of wells to cesspools; but cholera was three times more fatal there than it had ever been. Finally, Mr. Simon insists strongly upon the contagium of cholera being transmitted through the excrements, and upon its connection with water supply.

Perhaps the most striking article that has appeared for a long time upon this interesting subject is by Prof. Max von Pettenkofer, of Munich, on the "Immunity of Lyons from Cholera, and the Occurrence

* 'British Med. Journ.,' 1867, i, p. 413.

of Cholera on Shipboard."* The immunity of that great city from epidemic attacks of cholera passed for long with little notice, for the fact fitted in with no received theory. Yet its immunity was well known, and during the European outbreak of the disease in 1865 20,000 people took refuge in Lyons from Marseilles, besides many from Paris, all flying before the dreaded pestilence. During the first epidemic of 1831-6 Lyons remained free from cholera, whilst, north and south, Paris and Marseilles suffered severely. But the immunity was still more strikingly exhibited in 1849. That was the year of the insurrection, and infected troops were repeatedly imported into the city and quartered upon the people. Still no epidemic spread to the civil population, and the few cases which did occur among the people were either imported, or were in those just discharged from the hospitals or among those in the hospitals. Yet all the conditions usually supposed to favour the spread of epidemic cholera were abundantly present in Lyons; there was the imported germ, want, filth, misery of all kinds, a debased population, and want of due sanitary measures.

In 1854, 24 or 25 cases of cholera were met with in Lyons, and these were certainly not all cases of non-epidemic summer cholera, and they occurred among civilians. Whilst in previous epidemics the whole of Lyons had its civil population entirely free from an epidemic of the disease, in 1854 certain *parts* of the city were affected with an epidemic.

In 1865 Lyons had no cholera. In 1866 a few cases occurred, but these were imported, and no epidemic occurred.

Thus Lyons has, with a slight exception in 1854, always resisted the invasion of epidemics of cholera. Pettenkofer well asks, how is all this explicable? The facts are utterly opposed to the views of those who say that, in order that cholera may spread, all that is required is the importation of infected matter in warm seasons, in the form of cholera stools, among a population living in damp dwellings with defective sanitary, and especially defective water-closet, accommodation. Equally untenable, he says, is the hypothesis of those who suppose that the drinking of a water containing a small quantity of infected organic matter by a people living in certain conditions, such as misery, immorality, cold, want, or in great fear, will almost certainly have the disease. These conditions were all abundantly present in Lyons, yet Lyons had no epidemic of cholera. The germs were again and again imported into the city; want and misery abounded; the people were out of employment; overcrowding prevailed; the houses were damp, many being made simply of puddled clay; and many parts of the city were frequently flooded by the two rivers which ran through Lyons. The prevalent local theory that this immunity is owing to the current generated by the meeting of the streams of the Rhone and the Saône within the city is next shown to be untenable. Suffice it to say that Lyons is less windy than many cities which suffered severely from cholera. Pettenkofer holds that four conditions are requisite in order that cholera may spread as an epidemic in any locality. These are—a specific germ, a peculiar condition of soil, a certain degree of warmth

* 'Zeitschr. f. Biologie,' iv, p. 400.

of the atmosphere, and individual predisposition. The peculiar condition of the soil requisite is this—it must be porous, and permeable to air and water. It must possess a particular degree of humectation, depending upon the position of the subsoil-water to the surface. It must be charged with organic, especially excrementitious, matter. A soil thus circumstanced he believes to be the essential condition for the development of epidemic cholera. It is the nidus in which, or the condition in which, the cholera poison once finding admission to it, undergoes that development which is necessary for its rapid dissemination among the people living upon the soil. This condition of soil fosters, not developes, the cholera poison. The latter must come from without, and finds its way into the soil, mainly, by means of the evacuations of those sick of the disease. And the reception is not alone sufficient to its multiplication and further propagation. It is only in a certain state of humectation of the soil that this aptitude to multiplication and propagation occurs; and this state has a definite relation to the recession of the subsoil-water after it has approached unusually near to the surface.*

The tenth report of the Medical Officer of the Privy Council is very instructive, containing, as it does, reports on the outbreaks of enteric (typhoid) fever in Winterton, in Guildford, and in Terling in 1867.

Winterton, in Lincolnshire, is a little town having a population of about 1800 persons. It had for the last seven years been almost always suffering more or less from the presence of enteric fever, and for the last two or three years the disease had been of great local importance. Sometimes it was more in one part of the town, sometimes more in another. In 1865-6 it particularly attacked a group of 35 houses at the west end of the town; and here, within the twelve months, out of 145 inhabitants, 100 contracted the fever, and 17 died of it; or, in other words, those 145 inhabitants suffered in that year from the one preventible disease as many deaths as a population seven times as great, in fair sanitary circumstances, is expected to suffer from all diseases and accidents put together. Early in 1867 enteric fever was again prevailing in large proportions in Winterton, but chiefly in another part of the town; and when Dr. Thorne was there in April there had been 55 new cases, and among them already 6 deaths. The cause of all this terrible sickness and mortality was evident at a glance. It was the merest question of filth. "The epidemic prevalence of fever in Winterton," he wrote, "is undoubtedly to be ascribed to the disgraceful state of the privies, cesspools, ashpits, and wells. . . . . Given, the existence of typhoid fever in a town, it is hardly possible to conceive conditions more favorable for its spread than those existing at Winterton." The conditions described are such as probably even the swine in the town may have suffered from; and it deserves notice that the scene of this disgraceful sanitary neglect was a town which four years previously had adopted the "Local Government Act."

The epidemic of enteric fever at Guildford was peculiarly instructive.

* *Vide* Mr. Radcliffe's "Report on Cholera," in 'Ninth Report of Med. Officer of Privy Council.'

Guildford is not ordinarily quite exempt from enteric fever; and during the first 28 days of August, 1867, 10 such cases had been seen scattered about in the town; when suddenly, within the next 33 days, there had arisen fully 250 cases of the disease, and of this large number 150 had arisen within a fortnight. The distribution of the disease, especially during the first fortnight of the epidemic, so nearly corresponded in area with a particular section of the public water-supply of the town as to raise the strongest suspicions that this section of the water-supply was at fault. And eventually these suspicions became a certainty. First, namely, it was shown that on one particular day in August—about ten days before the beginning of the outbreak—330 of the 1675 houses of Guildford had exceptionally received their water from a certain high service reservoir which had been previously filled from a new well; and that the persons residing in or frequenting these 330 houses constituted the part of the population on which the epidemic influence had almost exclusively fallen. Subsequent chemical examination of the water of the new well detected in it the products of organic decomposition, and examination of the local circumstances showed, but too unquestionably, whence the decomposing animal matter had been derived. The new well, no one could doubt, was most dangerously situated; in the porous and fissured chalk stratum it was within ten feet of various sewers, one of which, indeed, was traversed, as a short cut, by the iron delivery pipe of the high service. And when, after the epidemic, this reckless confusion of sewer and water-works was dissected, the state of the things found at the spot was reported as follows—"The engineers employed in the repairs of the steam engine noticed some exudation on the wall of the engine-house next the alley where the sewer runs, and the pit of the fly-wecel contained a notable quantity of the same. As the exudation had the smell of sewage, the ground was opened in the alley at a point adjacent to the engine-house. The sewer was found leaking in various places, and the soil between it and the wall of the engine-house was saturated with the sewage, of which as much appeared to run outside as inside the sewer. . . . . All the joints gave exit to water, and the ground was a quagmire of filth beneath and on each side. Dark coloured fœtid slush had to be dug out and removed in baskets, making the men vomit who were employed in the work." There, of course, could not be any reasonable doubt but that the passage of this filth into the well, from which the high service reservoir was filled, had been the cause of the epidemic. The whole number of deaths from fever up to the end of the epidemic was 21, and the total number of cases of fever from August to December was roughly computed at 500.

The epidemic at Terling, in Essex, was one of extraordinary dimensions. In that village of only 900 inhabitants, and for the most part within a period of two months, fully 300 persons were attacked with enteric fever, and 41 of the number died. The conditions which rendered possible this most calamitous visitation of disease were conditions of local filth. At Terling such conditions were at their worst. Round what pretends to be the house-accommodation of the tillers of the soil in Terling—a scanty, overcrowded supply of dwellings of the meanest

description—every possible source of pollution of air and water was accumulated; the peculiar porous soil which underlay all this filth was, of course, continuously absorbing it; the water supply of the population was derived from wells, most of them sunk in that excrement-sodden sponge of earth. Some ten days before the outbreak of the fever, after an extraordinary period of draught, a sudden great rise in the water-level of the wells was observed, and this, of course, denoted a long-delayed scouring of that foulest soil into the water-supply of the now poisoned population. The filth which did so enormous an injury to human life existed under definite legal responsibility. The nuisance authority of the place (the Board of Guardians of the Witham Union) had most grossly neglected its duty, and after every opportunity had been afforded it of taking action, the Home Secretary was obliged to put in force the compulsory provisions (sections 16 and 49) of the "Sanitary Act, 1866."

A sub-report on the distribution of phthisis as affected by dampness of soil, points out the dependence of this disease on this condition, and that when it is removed, as by drainage, the mortality from phthisis in a given district is much diminished. Dr. Thudichum also continues his researches into the chemical pathology of cholera, an inquiry which, interesting as it is, does not immediately concern us here.

Disinfection.

Dr. Heppe* publishes a paper containing a *résumé* of the recent progress of this branch of sanitary science. His memoir is of especial interest, as its deals with the *rationale* of the action of various disinfectants.

Dividing disinfectants into absorbents, chemical decomposers, and antiseptics—all of which may be used for the disinfection of air, water, and food, clothing and linen, excrements, drains, and sewers, and for the local disinfection of the body—Heppe admits that this division cannot in practice be strictly carried out. Under the head of absorbents and chemical substances acting as disinfectants he places, porous bodies, such as charcoal, turf, peat, mould, and humus, all of which not only retain gases, but likewise liquids. As disinfection proper, *i. e.* the destruction of noxious matters, takes place by means of oxidation (and this is in great measure brought about by atmospheric ozone), chemical action always accompanies absorption, and hence the two processes cannot be separated. Quicklime has been much vaunted as an absorbent; applied to fresh fæces, it absorbs sulphuretted hydrogen, and forms with albuminous matters a hard solid that does not readily undergo putrefaction, and is very absorbent of water. It is not, however, advantageous to apply lime to fæcal matters which have already undergone decomposition, for in this case ammonia is liberated abundantly.

As chemical agents, chloride and sulphate of iron, chloride of manganese, and sulphate of zinc, are extensively used as disinfectants. The action of these is to fix ammonia, its derivatives, and sulphuretted hydrogen. Mineral acids are less useful, as they can only fix ammonia and

* 'Schmidt's Jahrb.,' 133, p. 119.

its derivatives; and by liberating sulphuretted hydrogen from sulphides they aggravate stenches. Chloride of lime, by reason of its hypochlorous acid, acts as an energetic oxidizer; but if it contain much free lime (and this sometimes forms one half of the commercial chloride) ammonia may be liberated from decomposed excrementitious matters. Hence, the use of this agent is not always to be advised. Liberation of ammonia may be avoided by neutralizing the chloride with an acid, which, moreover, by rendering the chloride more energetic, becomes an economical addition; but in the hands of the unskilful free chlorine is likely to be generated. Gypsum, alum, soluble silicates, and sulphuric, according to Stromeyer, are not true disinfectants, since they merely serve to fix ammonia, and leave the sulphuretted gases untouched. Green vitriol, though it fixes sulphuretted hydrogen, increases the gutter-stink (gossenkothgeruch). Iodine and bromine, on account of their cost, can seldom be employed. A dilute solution of chloride of lime acidulated with an acid, solutions of permanganates and manganates, especially when acidulated, and carbolic acid in its various forms, are among the best disinfectants. The *rationale* of the action of carbolic acid is, perhaps, unknown.

An anonymous writer contributes an excellent article on this subject to the 'American Journal of Medical Sciences.'*

Dr. Angus Smith, of Manchester, who is, perhaps, one of the first European authorities on the subject of disinfectants, has recently published a work on this subject which should be in the hands of every medical man.† The author draws his information from all ages; he discusses the perfumed pomades of the ancients, the conserve of roses of the Athenians, the purification by fire of the Hindoos, of Hippocrates, and of Zeno of Constantinople; the labours of Hercules, who saved the Elians by draining their marshes; the embalming of the Egyptians; the sulphur fumigation of Ulysses; the anæsthetics mentioned by Pliny and Galen applied to surgical operations. He discusses these with the more modern experiments of Dr. Petit, Sir John Pringle, Guyton Morveau, Dr. Carmichael, Smyth, Fourcroy, Hildenbrand, Dr. Henry, and others; and, comparing their processes with those adopted in our time, shows that, throughout the immense mass of empiricism of a bygone time there runs a thin thread of gold which he has interwoven with his own researches, and so raised the whole subject to the dignity of an exact science. The following quotation, given by Dr. Angus Smith, shows that the ancients were, in some things, quite as alive as the moderns to sanitary questions. Justinian says, "The prætor took care that all sewers should be cleansed and repaired for the health of the citizens, because uncleansed and unrepaired sewers threaten a pestilential atmosphere, and are dangerous." Would that all sewer authorities of the present day were as well informed as Justinian!

Dr. Angus Smith offers the following apposite remarks on the burning of dead bodies, which has been advocated of late as a means of obviating the danger occasioned by their multiplication in and about

* Vol. lvii, p. 149.

† 'Disinfectants and Disinfection,' by R. Angus Smith, Ph. D., F.R.S., F.C.S.

large cities:—"Many people think that we ought, like some of the ancients, to burn our dead. They do not consider what a terrible proposal they are making. To burn a body without producing the smell of burning flesh is a most difficult thing, and far surpasses the problem of burning our smoke, which, however important, is still left undone. The expense of keeping up such a lake of fire as to consume all our dead would also be, in all probability, too great. Let us imagine 1500 bodies roasted to ashes in London every week. We shall not enter into the details of a large manufactory of phosphates, as we must call it, because it is painful to dwell on the horrors of the picture, and conjure up the details." He also says, relative to the vexed question, Will a sewer produce cholera, or plague, or cattle disease? "We cannot say so, or that every kind of disease may be produced from such accumulations of organic matter. The great epidemics that have passed over Europe seem always to have come from some extraneous source, to act as if planted by seed, and not to have risen up spontaneously here. Without attempting to examine this matter carefully, the result here would seem to be that, while the decomposition of organized beings after death produces gases and vapours that are opposed to health, these gases or vapours are incapable of originating, although they may be capable of feeding, some of these diseases—such as cholera or plague—which have been observed at all times to come from a warmer climate. There must, however, be some first origin of these diseases; and we cannot prove that the first origin might not take place in our climate, although it seems probable that it requires a warmer sun and a richer vegetation than is to be found in the north. This, however, is sufficiently made out—that, when these diseases do come amongst us, they take root with most effect in those places where decomposing matter is found. If we were to suppose a seed of a disease planted in a rich fertile soil of decomposing matter, we should give a pretty fair description of the fostering effect of impurity on disease. It would, in fact, appear as if the putrid matter itself took the disease and transferred it to the living. There seems to be nothing entirely opposed to this view of the case. The question, however, is, and has always been, What is the nature of that substance which may be said to form the seed or germ of disease? Chemists have been inclined to consider it a substance in process of decay. Physiologists and microscopists have been more inclined to consider it as an organized substance." After enumerating the experimental researches upon which this latter view (to which Dr. Smith himself inclines) rests, he says, "If we examine previous inquiries into the compounds resulting from the decomposition of organic substances, we shall find nothing which is at all calculated to bring out such an intelligible rational view of the origin of many diseases, and also of some phases of putrefaction. Chemists, when they have examined products of the latter action, have found sulphuretted hydrogen, carburetted hydrogen, hydrogen, carbonic acid, nitrogen, ammonia, acetic acid, lactic acid, butyric acid, and numerous uncertain bodies having no activity, and utterly incapable of producing those prodigious results that are found when that force begins to work which produces plague, smallpox, or black death."

Ventilation of sewers.—M. Friedmann* proposes an ingenious plan for ventilating sewers and rendering their gases innocuous by means of aspirating furnaces, through which the mephitic gases are led and in which they are consumed. They are then to be discharged into the air by means of high chimneys at an elevation superior to that from which air is directly drawn for the purposes of respiration.

Scarlatina.

Dr. Ballard, in a paper read before the Metropolitan Association of Medical Officers of Health on November 21st, 1868, attempts to explain the epidemic waves of scarlatina. From a record of his own cases, extending over eleven years, he finds that the least prevalence of the disease was in March, and the greatest in September, October, and November, at which season there was every year an apparent attempt at epidemic extension. He infers that in any year scarlatina may be expected to spread when the mean temperature, having risen above 60° Fahr. in the course of the summer, has begun to fall below that temperature, if, at the same time, the humidity of the atmosphere increases to 75 per cent. or upwards. As the temperature becomes lower in the course of the epidemic, the higher the humidity of the atmosphere, the more numerous will be the cases. As the cold of winter comes on the epidemic dies away. Dr. Ballard's conclusions are founded on the personal observation of 3412 cases.

Cancer fields.—Mr. Haviland brought before the Medical Society of London on November 30, 1868, an elaborate series of statistical facts relative to the geographical distribution of cancer in England. In a map he shows, in two different colours, the fields in which cancer is most and least prevalent. On reviewing the cancer fields the author shows that they all have certain peculiar characters of site and soil, which may be summed up thus:—1st, they are districts sheltered from the prevailing sea winds by the heights which gave rise to the river system, 2nd, they lie along the banks of fully formed rivers, in low or deep valleys, and their sites, geologically considered, invariably belong to the tertiary and more recent formations, amongst which the London clay, as seen in the Thames fields, holds a prominent place. Cancer seems to haunt low-lying ground, through which large rivers flow to the sea; and those districts are especially favorable to the development of the disease that are traversed by rivers which, during wet seasons, overflow their banks and flood the adjacent country.

Diseases of miners.—Dr. Poleck† controverts the assertion of Dr. Scheidemann that carbonic oxide is the deleterious substance left in mines by the explosion of gunpowder, and attributes the noxious effects to sulphuretted hydrogen and carbonic acid; the former being partly liberated, subsequent to the explosion, by gradual liberation of the gas from the sulphide of potassium, which always forms a considerable

* 'Prag. Vierteljahrschr.,' xciii, p. 127.
† 'Schmidt's Jahrb.,' 140, p. 343.

portion of the solid residue of the exploded powder. Want of space forbids us entering upon the arguments and facts on which Dr. Poleck grounds his views. In order to avoid the ill effects of the powder-gases, he recommends the liberal use of slaked lime in the pits.

Contagiousness of carbuncular affections.—M. Gallard contributes an able article on this question,* and contends against the belief, much more prevalent in France than in this country, that carbuncular affections and malignant pustule are always the result of contagion. He quotes several cases in which it is clear that contagion or inoculation with the virus of the affection would appear to have been impossible. M. Gallard thinks, in opposition to the views of the great majority of French physicians, that inoculation or contagion should be shown in order to prove that malignant pustule never arises except through such agencies, and that contagion ought not to be rashly assumed when it cannot be proved that this was quite out of the question.

Phthisis.—Dr. Bergeret † contends that the air which proceeds from the lungs of the phthisical is the vehicle that transports the tuberculous elements from the diseased to the healthy body, and that the transmission of pulmonary phthisis may be prevented by measures of private and public hygiene.

Disease in masons.—M. Feltz‡ thus concludes an article upon this subject:—(1) The penetration of impalpable organic or inorganic dust into the lungs cannot be denied. (2) Such dust sets up inflammatory action, which almost always leads to pulmonary cirrhosis, sometimes to ulceration of the pulmonary parenchyma, and to tuberculosis if the individual be predisposed to this. (3) Thanks to the microscope, it is easy to distinguish between the tuberculous nodules, the cirrhotic nodules, and the nodes of tubercular pneumonia. Dr. Headlam Greenhow's investigations, and the ingenious method by which he was enabled to detect siliceous particles in the lungs by a chemical process, will suggest themselves to the minds of our readers.

Cellar dwellings.—Dr. Lehnerdt, of Berlin, in an article on the cellar dwellings of that city,§ recommends a cubic space of nearly 550 cubic feet for each adult inhabitant of such dwellings, and for children under ten years of age half that cubic space. Dr. Mapother states in his recently published new edition of his work on public health ‖ that in Dublin it has been thought advisable not to insist upon more than 300 cubic feet of breathing space for each adult. MM. Robinet and Barreswill, in their 'Report of the Commission on Insalubrious Lodgings for 1862—1865,'¶ recommend the use of the thermometer in determining the salubrity of underground habitations. It is well known

* 'Ann. d'Hyg.,' xxix, p. 5. † Ibid., xxviii, p. 312.
‡ Ibid., xxvii, p. 174.
§ 'Vierteljahrsschr. f. gericht. u. offent. Med.,' viii, p. 250.
‖ 'Lectures on Public Health,' 2nd edition, 1867, p. 310.
¶ *Vide* review in 'Ann. d'Hyg.,' xxx, p. 195.

that where there is no sufficient removal of the air in such dwellings the temperature does not vary to any great extent with that of the external air, but is habitually cooler in summer and warmer in winter than out of doors.

Vaccination.

Dr. Ballard would be glad to see animal vaccination introduced into this country as a part of our national arrangements for the prevention of smallpox, and believes that good would result from it.* Not that he would go the length of condemning arm-to-arm vaccination, a practice which he thinks it not at all desirable that we should abandon. He believes experience shows, that although human transmission gradually weakens the energy of the vaccine virus, it is long before the weakening becomes sensible, so long that the occasional renewal of a supply where arm-to-arm vaccination is practised, and the vaccinifers carefully selected, is all that is needed so far as the quality of the virus is concerned. He describes, from personal observation, the procedure as followed by M. Chambon in Paris, thus:—Arrangements are made by which a succession of heifers or calves, of about the age of five months, is provided. These are carefully stabled, and fed upon the diet to which they have been accustomed. The animal to be vaccinated is placed on its left side, and fastened down upon a table of convenient construction, and the operator proceeds to shave with a dry razor the right side of the abdomen, commencing from the udder and over a space of about ten inches long by six or eight broad. The calf which is the vaccinifer is laid also upon its left side and fastened down, and the fluid is obtained from a pock by forcible compression of its base by a pair of spring forceps, and the result is the rupture of a pock, and the abundant flow from it of a quantity of a thickish sulphur-coloured fluid, which is taken upon the lancet, or into capillary tubes, for the purpose of preservation. The animal on the table is vaccinated upon the shaven surface by puncture in sixty or eighty places, and means are adopted to prevent subsequent injury by biting or licking. Pocks, which finally attain the size of large human vaccine pocks, speedily begin to rise, and are used for the vaccination of children from the fourth to the sixth day. Subsequently to this the vaccine they contain is found to be less active, but still sufficiently so for the vaccination of another calf, for which the pocks left unopened are therefore used on the seventh or eighth day. The grounds upon which animal vaccination is advocated are mainly three, and refer to the following points, namely, the quantity of virus which may, so to speak, be manufactured, its energetic quality, and its purity. If animal vaccination were regularly practised the dangerous delays which not unfrequently occur during threatened outbreaks of smallpox from a failure in the requisite supply of lymph could not take place, since the supply from sixty or seventy pocks would be practically inexhaustible. Another advantage is that the vaccinifer can be readily made to travel to any place where a local demand for virus may suddenly arise. One or two heifers kept in London, for example, would

* 'The Public Health,' 1868, p. 8.

suffice for any demand likely to be made in any part of the metropolis or in the provinces.

Syphilitic vaccination.—Dr. W. Krassilnikoff, of St. Petersburg, thus concludes a long and able paper on this subject*:—(1) When a person suffering from latent syphilitic disease is vaccinated, secondary syphilitic affections may be developed under the influence of the vaccination, which are shown chiefly as syphilitic exanthemata; but primary syphilitic sores never appear at the seat of vaccination. (2) If from a person suffering with syphilis pure vaccine lymph, unmixed with the blood of the affected person, be taken, and a healthy individual be vaccinated with it, regular vaccine vesicles are invariably developed without any syphilitic complication ensuing then or at a later period. (3) But if vaccine lymph be taken from a syphilitic person, whether the syphilis be in an active or latent condition, mixed with a little of the blood of the affected person, and a healthy individual be vaccinated with it, two diseases become developed through the same inoculation—cow-pox from the vaccine lymph, and syphilis from the syphilitic blood. (4) In such cases the cow-pox is developed first, because its incubation-stage is the shorter, and it proceeds more rapidly. Syphilis shows itself later, and appears first at the place of inoculation. (5) On the site of inoculation a sore is developed with hard edges, accompanied by swelling of the neighbouring glands; in short, a sore with all the characters of syphilitic chancre. (6) Symptoms of secondary syphilis follow such a sore after the lapse of the customary period, as if the infection had resulted in the ordinary manner. (7) It is hence very important to take no vaccine lymph from individuals in a doubtful state of health; as for new-born children, lymph should never be taken from them during the period in which the symptoms of hereditary syphilis ordinarily appear. (8) When, from certain circumstances, this last rule cannot be followed, care must be taken to obtain the lymph without any admixture of blood or of any syphilitic fluid. (9) Under no circumstances must further vaccination be performed with lymph from persons suffering from clearly marked syphilis.

Burial of the dead.—Dr. Rüppell concludes, as follows, an exhaustive article † on the choice of sites for cemeteries, due regard being paid to the protection of the neighbouring inhabitants from injurious gaseous emanations, to the prevention of water-contamination, to the cost, and to the customs and feelings of the living. Cemeteries should be enclosed by a paling, hedge, or wall, which, however, need not exceed four feet in height. They should be well turfed and abundantly planted with shrubs; large trees need be planted only on that side nearest the adjacent town or village. If a well be made in the cemetery, it should be lined with hydraulic cement. Should the water have a bad smell or taste, or be altered in appearance, the further use of the well-water for drinking purposes ought to be interdicted. We, in England, should be very loath to drink such water at any time. The fact that the air of the cemetery has an ill odour

* 'Deut. Zeitschr. Staatsarznknd.,' xxvi, p. 3.

† 'Vierteljahrsschr. f. gericht. u. offent. Med.,' viii, p. 23.

should be at once notified by the grave-diggers. No building ought to be erected in a cemetery except a house for the sexton, and a mortuary. A scheme for the apportionment of the graves must be laid down by the conductors of every cemetery. Twice as much superficial area should be allowed to adults and to children above ten as to those under ten years of age. On the plans the sites of graves must be numbered consecutively, and the graves constructed in the same order. Dividing the deceased into those above and those below ten years of age, the first class must have a superficial area of 9×6 feet, and the second of $6 \times 3\frac{1}{2}$ feet (Prussian). Provision is then made for keeping the registers of the graves. The interment of more than one corpse in a grave ought to be forbidden. The graves of those above ten years old should have a depth of 6 feet, those of children under that age should be $3\frac{1}{2}$ feet deep, and the soil should form mounds of the heights of 2 feet and 1 foot respectively. On arriving at the grave the coffin should be entirely covered with earth before the religious ceremony commences. Old graves may be used again after the lapse of thirty years. If bones be turned up in reopening the graves they are to be placed at the bottom of the new grave; and if undecomposed soft parts of the body are met with, these must be buried deeper than portions of the hard skeleton. If on opening a grave a bad smell be perceived, the grave is to be immediately closed. Dr. Rüppell also gives various other directions, which we omit, that are of less interest.

Legislation.

Several new Acts of Parliament have been passed during the last two years having important bearings on the public health of this country.

The "Vaccination Act, 1867," is a measure of increased stringency for the enforcement of the practice of vaccination.

The 31st and 32nd Vict., cap. 36, very properly makes perpetual the "Alkali Act, 1863."

On February 1st, 1869, the "Petroleum Act, 1868," came into force, and provides for the safe keeping of petroleum. It is enacted that petroleum shall include any product of the distillation of minerals giving off an inflammable vapour at a temperature of less than 100° Fahr. No petroleum, otherwise than for private use, is to be kept within fifty yards of a dwelling house. It is earnestly to be hoped that this statute may reduce the accidents which from time to time occur from the ignorant management of petroleum and rock oils.

The 31st and 32nd Vict., cap. 80, amends the "Contagious Diseases Act, 1866."

The 31st and 32nd Vict., cap. 87, has for its object to further extend and make compulsory the practice of vaccination in Ireland.

"The Sanitary Act, 1868," amends the "Sanitary Act, 1866." Its chief provision is that which permits the erection of dry earth-closets in lieu of water-closets.

"The Artisan's and Labourer's Dwellings Act, 1868," contains most important provisions. Any four or more householders may represent to an officer of health that any neighbouring premises are in a state dangerous to health. The officer of health, with or without such requisition,

may report, after inspection, to the local authority that any premises are in a condition dangerous to health; whereupon, on the report of a surveyor or engineer, the local authority may require works to be executed by the owner of the property, or may even demolish the premises. Many haunts of infectious diseases will, doubtless, be swept away under this statute.

The "Workshop Regulation Act, 1867," only came into full force at the commencement of the current year. This merciful enactment, which is an extension of the Factory Act to workshops employing less than fifty hands, contains the following provisions:—(1) No child under the age of eight years shall be employed in any handicraft; (2) no child under 13 years of age shall be employed in any handicraft for more than 6½ hours daily, the work to be between 6 a.m. and 8 p.m.; (3) no woman, and no person between the ages of 13 and 18 years, shall be employed for more than 12 hours daily: these hours must be between 5 a.m., and 9 p.m., 1½ hour being allowed out of this for meals; (4) no woman and no person under the age of 18 years is permitted to work in any handicraft on Sunday or after 2 p.m. on Saturday; except on Saturdays when not more than 5 persons are employed in the work shop; (5) no child under the age of 11 years shall be employed in grinding in the metal trades, or in fustian cutting. Certain provisions are made for the education of children employed in workshops; and the use of a fan to prevent inhalation of dust may be insisted upon.

Already the west-end milliners are reaping the benefit of this Act.

"The Metropolitan Poor Act, 1867," makes most important provisions for the building asylums for the insane, and providing in- and out-door medical relief to the sick pauper. Already great good has resulted from its enforcement, though it is to be regretted that want of economy in its administration has provoked opposition among the ratepayers.

"The Pharmacy Act, 1868," provides for the registration and regulation of chemists and druggists, and persons keeping open shop for the retailing, dispensing, or compounding of poisons. All persons selling or compounding poisons, or assuming the title of chemist and druggist, are to be qualified and registered by the Pharmaceutical Society. "Poisons" are divided into two classes:—(1) Arsenic and its preparations; prussic acid; cyanides of potassium and all metallic cyanides; strychnine and all poisonous vegetable alkaloids and their salts; aconite and its preparations; emetic tartar; corrosive sublimate; cantharides; savin and its oil; ergot of rye and its preparations. (2) Oxalic acid; chloroform; belladonna and its preparations; essential oil of almonds, unless deprived of its prussic acid; opium, and all preparations of opium or of poppies. The Council of the Pharmaceutical Society has power to add to their list. No poison is allowed to be sold unless the vessel in which it is contained be distinctly labelled with the name of the article and the word poison; and no poison in the first class may be sold except under certain stringent formalities.

We trust that this enactment may tend to diminish the lamentable number of cases of accidental and suicidal death from poison in this country. The Act does not extend to Ireland.

INDEX.

Abdomen, gunshot wounds of, 326
— tetanus after injury to, 187
Abelin, treatment of erysipelas, 71
Abscess of liver, cases of, 181
— kidney, cases of, 175
Absorption (Demarquay, Hoffmann), 10
Accommodation, effect of enfeebled, 361
— experiments on (Hensen, Voelckers), 341
Acid, carbolic, action on tissues, 476
— do., antiseptic treatment by (Lister), 198
— do., inhalation of, in phthisis, 128
— do., poisoning by, 334
— do., use of, in burns, 334
— do., use of, in syphilis, 45
— carbonic, influence of, on action of heart (Cyon), 11
— hydrocyanic, cause of poisonous action (Preyer), 451
— do., poisoning by, 451
— kinovic, 474
— lactic, application in diphtheria, 66
— do., in osteomalacia, 399
— picric, use of (Ranvier), 1
— sulphurous, in ulcers of larynx, 45
— uric, elimination of, 31
— do., mode of estimating amount of, 169
— do., origin of (Meissner), 31
Acupressure of arteries in inflammation, 288
— opinions on, 208
Acupuncture in diagnosis of uterine tumours, 380
Adenoma of breast, spontaneous separation of, 320
Ague, treatment of, 57
Akazga, poisoning by, 454
Albuminous substances, action of pancreas on, 8
Albuminuria in pregnancy, 388
Alcohol, elimination of, by the kidney (Thudichum, Dupré), 5
— in acute diseases (Gairdner), 69
Alcoholic narcotism, on (Wade), 328
Alcoholism, report on, 54
Alimentary organs, authors on diseases of, 167
Alkaloids, sublimation of (Guy), 460
Allantoin in urine, 32
Allbutt, classification of skin diseases, 189
Althaus, removal of tumours by electrolysis, 201
Amaurosis, authors on, 375
— from lead poisoning, 362
— in pregnancy, 388
Amputation at the hip-joint (cases), 225
— at hip-joint for gunshot wound, 326
— at knee-joint (Longmore, Brinton), 223
— Chopart's, 252
— of thigh, leaving patella, 224
— do., statistics of, 269
Amyloid degeneration (Murchison, Dickinson), 70
— do., sulphate of indigo test for, 71
Anæsthesia, local, sloughing with, 215
Anæsthetic agents, 193
Anæsthetics, new, 474
Anastomoses between arteries and veins (Bernard, Sucquet), 11
Anchylosis, new operations for, 256
Andrews, case of tetanus, 98
Aneurism, abdominal, 143
— aortic, 142
— do., distal ligature in, 296
— do., tracheotomy in, 141
— arterio-venous, of bend of elbow, 289
— cirsoid, injection of iron in, 296
— complete arrest of circulation in, 292
— digital compression in, 289
— direct compression in cure of, 290
— femoral, sac laid open, 299
— inguinal, compression in, 290, 295
— intra-orbital, ligature of carotid in, 298
— of abdominal aorta, cure of, 292
— of carotid, 290
— of cerebral vessels (Béhier), 87
— of femoral, 289
— of palmar arch, 289
— osteo, of tibia, 242

Aneurism, of uterine artery, 410
— pulmonary, 142
— spontaneous cure of axillary, 299
— thoracic, with dementia (Moore), 72
— treatment of, laying open sac in, 299
— use of cold in, 291
Annandale, removal of an encephalocele, 274
Anstie, on alcoholism, 54
— on neuralgia, 91
— report on medicine, 33
— sphygmograph, 149
Antimony in alcoholism (Anstie), 56
Aorta, abdominal, aneurism of, 292
— do., compression of, in inguinal aneurism, 295
— do., ligature of, 296
— rupture of, 144
Aphasia, report on, 80
Arsenic in gastralgia (Leared), 93
— poisoning by, 446
Arterial murmurs, non-aneurismal, 143
Arteries, communications of, with veins (Bernard), 11
— compression of, in inflammation, 288
— iliac, plugging of, 144
— influence of sensory nerves on (Lovén), 12
— ligature of, in inflammation, 284—289
— lingual, ligature of, 297
— subclavian, ligature of both, 296
Artery, carotid, ligature of, in intra-orbital aneurism, 298
— common femoral, ligature of, 298
— external iliac, ligature of, in elephantiasis, 300
— femoral, digital compression of, in elephantiasis, 289
— pulmonary, aneurism of, 129
— do., thrombosis of, 144, 432
Ascites, on (Habershon), 164
Asphyxia, 465—468
— from defect of swallowing, 154
— in infants, 420
Asthma, morphia in (Hirtz), 108
Astigmatism in children, 372
Atrophy, progressive muscular (Fagge), 95
Atropine drops, poisoning by, 347
Aveling, new form of forceps, 402

Baker (Morrant), mode of inheritance of cancer, 228
Ballard, on scarlatina, 497
— on vaccination, 499
Banks, case of gangrene of lung, 116
Baobab, 475
Barbosa, sulphur in diphtheria, 66
Barclay, cases of delirium, 77
Barnes, case of amputation at the hip-joint, 225
— chorea in pregnancy, 392
— detection of early pregnancy, 383
— induction of labour, 407
— pregnancy with smallpox, 391
— report on midwifery, 377
Barwell, on lateral curvature of the spine, 244
Basham, case of dropsy without albuminuria, 168
Bastian, on tubercular meningitis, 425
Bateman, loss of speech, 82
Bath, influence of, on temperature (Lombard), 16
Baths, absorption by skin in use of (Ritter, Clemens), 10
Bazire, case of paralysis of the diaphragm, 108
Béhier, aneurisms of cerebral vessels, 87
Beckler, pneumonia, 115
Bedall, on koussin, 475
Beigel, inhalation in croup, 104
Belladonna, action of (Harley), 481
Bergmann, extraction of cataract, 355
Berlin, cases of foreign bodies in eye, 359
Bernard (Claude), communication between arteries and veins, 11
Berthollet, quinine in nervous diseases, 97
Besnier, incubation of diseases, 68
Bickersteth, osteo-aneurism of tibia, 242
Bidder, on saliva of sheep, 6
Bierbaum, typhlitis stercoralis, 161, 436
Bile, colouring matter of, spectroscopy of, 8
— do., spectrum analysis of (Thudichum), 5
— ducts, contraction of, 184
— do., termination of (Kölliker), 8
— resinoid acids of, spectroscopy of, 9
Billroth, on traumatic fever, 226
— on bromide of potassium, 476
Binocular vision, on (Donders), 341
— restoration of (Javal), 361
Birkett, treatment of ununited fracture of humerus, 259
Bischoff, lesser petrosal nerve, 21
Blix, disease of tricuspid valve, 134
Blondlot, on blood-stains, 464
Blood, circulation of, 11
— corpuscles of, physiology of, 2
— do., protrusion of (Colnheim), 53
— crystals of (Preyer), 3
— gases of, physiology of (Schmidt, &c.), 3
— physiology of, 2
— spectrum analysis of, 4

Blood, spectrum of, after suffocation, 468
Blood-stains, spectroscopy of, 464
Bohme, pneumonia, 114
Boismont, on moral insanity, 472
Boisseau, pyo-pneumothorax, 131
Bouisson, immediate union after lithotomy, 315
Boissonneau, treatment of staphylomatous eyeball, 346
Bones, lactic acid in, 399
Bonnafont, treatment of syphilis, 46
Bouchut, thrombosis of cerebral sinuses in children, 426
Bouillaud, aphasia, 80
Bourdillat, bronchial concretions, 106
— hæmatocele of orbit, 344
Bourdon, plugging of iliac arteries, 144
Bradley, case of fatal hæmatemesis, 158
Brain, abscess of (Gull, Sutton, Meyer), 85
— action of, in speech, 81
— interstitial inflammation of (Virchow), 78
— intimate structure of (Lockhart Clarke), 22
— vessels, aneurisms of, 87
— vessels of, embolism of, 74
Breslau, infanticide, 468
Bricheteau, case of cancer of heart and ovaries, 138
— lactic acid in diphtheria, 66
Brinton, on amputation at knee-joint, 224
Broadbent, chemical action of poisons, 445
Bronchial concretions, 106
Bronchi, dilatation of, 117
Bronchitis, chronic, in children, 106
Broughton, on cinchona, 479
Brown (Crum), experiments on poisons, 441
Bruce, fragment of rib encapsuled in lung, 242
— wounds produced by the new bullets, 327
Bruit, mitral, without organic disease, 137
— presystolic (Peacock, Gairdner), 135
Bryant, case of excision of spleen, 220
— case of internal strangulation of bowel, 302
— on persistent priapism, 317
— on torsion, 207
Bryce, renal cyst with pregnancy, 397
Buchanan, ligature of external iliac in elephantiasis, 300
Bullets, wounds produced by the new (Bruce), 327
Bundu, poisoning by, 454
Burdon-Sanderson, influence of movements of respiration on the circulation, 11
Burkart, influence of recurrent laryngeal on respiration, 13
Burn, ulceration of duodenum after a, 158
Burr, treatment of alcoholism, 57

Cadmium, action of (Marmé), 445
Cæsarian section, 405
Caffein (Leven), 483
Calabar bean, action of, on eye, 340
— poisoning by, 456
Calculi, several, in bladder, 308
— spontaneous fracture of, 310
Calculus, large, crushed after lithotomy, 314
— large pin in centre of, 308
Callender, cases of acupressure, 212
— dislocation of hip, manipulation in, 235
— fatty diaphragm, 108
— on staphyloraphy, 231
Campbell, on ligation of arteries in inflammation, &c., 284
Camphor in cholera (Viseur), 67
Cancer, changes in, during feverish attacks, 69
— fields (Haviland), 497
— inadequate operations for (Moore), 230
— inheritance of (Baker), 228
— of heart, &c., 138
— of orbit, 346
— of parotid gland, 218
— simulated by syphilis (Wilks), 43
— treatment by acetic acid, 231
Caradec, injection of spina bifida with iodine, 275
Carbon, tetrachloride of, use of, 196
Carblom, on male fern, 477
Carbolic acid, action on tissues, 476
— use of, 198
— do., in burns, 334
Carbonic oxide, poisoning by, 459
Carbuncles, contagiousness of (Gallard), 498
Carter, report on ophthalmic surgery, 338
Cartilage, loose, case of, 241
Casati, case of Cæsarian section, 406
— pelvic deformities, 399
— use of forceps, 403
Cataract, extraction of (Graefe), 356
— do. (Knapp), 355
— operations for removal of, 351
Cerebral vessels, embolism of, 74
Cephalotripsy, 404

Cervical tumour, removal of a (Spence), 216
Chancres, differences of, 42
Charcot, causes of gout, 49
Chauveau, nature of vaccine virus, 66
Cheever, on œsophagotomy, 221
Chevallier, poisoning by arsenic, 448
Children, mortality of, 422
— paralysis with muscular atrophy in, 335
Chloroform in malaria, 59
Cholera during pregnancy, 391
— hygiene of, 485
— temperature in (Güterbock), 67
— treatment of, at Posen, 67
Chorea, cases of (Ogle), 88
— conium in (Harley), 87
— in children, 431
— in pregnancy, 392
Choroid, authors on affections of, 375
— in tuberculosis (Galezowski), 39
Christiforis, diseases of pregnant women, 387
Cilia, number of vibrations of (Engelmann), 23
Ciliary movement, on (Stuart), 22
Cinchona barks and alkaloids, 479
Circulation, application of graphic process to, 146
— impeded, use of compressed air for, 145
— influence of vagi on (Ainser, Lohe), 12
— influence of movements of respiration on (Burdon-Sanderson), 11
— organs of, authors on, 151
— do., diseases of, 133
— report on physiology of, 10
Clark (Andrew), cases of duodenal perforation, 158
— in fibroid phthisis, 124
Clarke (Lockhart), histology of brain, 22
Clavicle, excision of, 262
— regeneration of, 262
Cleland, action of intercostals, 13
— (Dr.), case of dislocation of shoulder with inversion, 236
Coccyodinia, 380
Cohn, anomalies of refraction in schools, 368
Cold, death from (Höche), 470
Collis, electricity applied to tumours, 204
Colour sensations, on (Galezowski), 365
Compression, digital, in aneurism, 289
— do., in elephantiasis, 289
— direct, in aneurism, 290
Concatto, fatty changes in fevers, 69
Conheim, on inflammation, 51
Coniin, action of (Werigo), 480
Conium, action of (Harley), 480
Conium, use of, in chorea (Harley), 87
Conjunctiva, affections of, 347
— authors on affections, 374
Convulsions, puerperal, 416
Coote (Holmes), use of carbolic acid in syphilis, 45
Costa, on narcein, 477
Cornea, authors on affections of, 374
— conical (Graefe), 349
— ulceration of, with paralysis of fifth nerve, 342
Corpuscles of blood, protrusion of (Cohnheim), 53
Cotton, on hæmoptysis from aneurism of pulmonary artery, 129
Cough, causes of (Nothnagel), 111
Couper, case of dislocation of both shoulders, 236
Croskery, case of empyema, 107
Croup, inhalation in (Beigel), 104
— spontaneous, in adult, 103
— tracheotomy for (Jacobi, Steiner), 102
— do., 234
— treatment of, 432
Cryptopia, 475
Crystals of blood (Preyer), 3
Cullerier, treatment of syphilis, 46
Cuming, case of aortic aneurism, 141
— case of empyema, 107
— non-organic mitral bruit, 137
Curare, action of, on eye, 340
— poisoning by, 455
Cuthbertson, ulceration of duodenum after burn, 158
Cyon, on action of heart, 11
Cystotomy for irritation of bladder, 316

Davidson, jaundice during pregnancy, 390
Day, nervous origin of rheumatism, 40
Debardeau, case of ossification of lung, 117
Delirium, cases of, 77
— tremens, treatment of, 56
Demarquay, absorption by rectum, 10
— ligature of lingual arteries, 297
Dementia and thoracic aneurism (Moore), 72
Depaul, treatment of syphilis, 47
Deprés, mercury in syphilis, 47
Desormeaux, apparatus for writers' palsy, 335
Diabetes, on (Oppolzer), 170
Diaphragm, abnormal development of, 108
— fatty, 108
— gangrene of, 116
— paralysis of, 108
Diarrhœa, chronic, of children (Muller), 159

Diarrhœa in children (Müller), 437
Dickinson, changes in spinal cord in tetanus, 328
— waxy degeneration, 71
Diday, treatment of syphilis, 48
Digestion, physiology of, 6
Digitalis, action of, 477
— in albuminuria, 390
— in alcoholism (Anstie), 55
— in suppression of urine, 174
Diphtheria, local application of lactic acid in, 66
— sulphur in, 66
— treatment of, in children, 439
Diplopia, periodic, cure of, 362
Disinfection, means of, 494
Dislocation at hip, 234
— at hip, irreducible (Hamilton), 236
— both shoulders, 236
— humerus, reduction of (Heine), 257
— metacarpus, 237
— of the spine, 276
Dogiel, on the lymphatics, 9
— on sounds of heart, 10
Dohrn, case of Cæsarian section, 406
— diameters of pelvis, 396
— on urine of fœtus, 419
— vital capacity of lungs after labour, 384
Dolbeau, mercury in syphilis, 46
Donders, action of vagus on the heart, 20
— binocular vision, 341
Donkin, case of pressure on vena cava, 184
Dor, measurement of ocular tension, 340
Douglas, case of heart disease, 140
Dreesden, case of abnormal fœtation, 393
Dropsy without albuminuria, 168
Duchenne, paralysis with muscular degeneration, 335
Duckworth, elimination by kidneys, 173
Duncan, on inversion of uterus, 411
Duodenum, perforation of (Clark), 158
— ulceration of, after a burn (Cuthbertson), 158
Dupré, alcohol in urine, 5
Dureau, lactic acid in diphtheria, 66
Durosiez, stenosis of tricuspid valve, 133
Dysentery (Morse), 162
Dyspepsia, forms of (Ullersperger), 157
Dyspnœa from impeded circulation, treatment of, 145
— treatment, of by compressed air, 145

Ear, diagnosis of diseases of (Hinton), 281
— removal of foreign bodies from (Hutchinson), 283
Eckhard, on saliva of sheep, &c., 6
Elbow, subperiosteal resection of, 264
Elbows, both, excision of (Holmes), 266
Electrical currents of muscle (Hermann), 26
Electricity applied to tumours (Collis), 204
— in affections of spinal cord, 94
— in neuralgia (Benedikt), 94
— in one-sided spinal paralysis (Rosenthal), 96
— in progressive muscular atrophy, 95
Electrolysis, removal of tumours by (Althaus), 201
Elephantiasis, digital compression of femoral in, 289
— ligature of external iliac in, 300
Embolism, melancholia from, 74
Embryo, diseases of, 421
Emphysema, general, from rupture of lung, 332
Empyema, cases of, 107
Encephalocele, removal of an (Annandale), 274
Encephalitis, congenital, 421
— interstitial (Virchow), 78
Engelmann, ciliary vibrations, 23
Engelken, spinal cord, 22
Enteric fever, epidemic of, 492
Epilepsy (Flint, Griesinger), 88, 89
— in children, 429
— simulation of, 470
Epileptiform neuralgia, case (Ramskill), 93
Epiphysis, lower, of tibia, separation of, 257
Erysipelas, phenomena of (Billroth), 227
— treatment of, 71
Escharotics, use of, in disease of joints, 259
Ether spray, use of, in aneurism, 291
Etherisation, loss of smell from, 84
Eucalyptus globulus, 474
Eulenberg, on bromide of potassium, 476
— pathology of sympathetic, 99
— pulse form in nervous diseases, 150
Excision of ankle-joint, 250
— clavicle, 262
— both elbows (Holmes), 266
— elbow, subperiosteal, 265
— knee, 266
— os calcis, 255, 271
— do., subperiosteal, 270
Exophthalmic goitre, 365
Eye, cases of injury to, 359
— diseases of, works on, 338
Eye, references to authors on affections of, 374
Eyelid, plastic operation on, 344

Face, neurotic atrophy of (Bärwinkel), 90

Fagge (Hilton), progressive muscular atrophy, 95
— on intestinal obstruction, 165
Falk, on blood-stains, 464
Fallopian gestation, 392
— tubes, passage of sound along, 381
Faradization. See *Electricity*.
Fat, absorption of (Sachs), 7
Fatty changes in brain (Virchow), 78
— in fevers (Concatto), 69
Fauvel, hygiene of cholera, 485
Fayrer, amputation at the hip-joint, 225
— case of rupture of liver, spleen, &c., 187
— case of sciatica, 277
— neuritis of sciatic, 89
— radical cure of hernia, 304
Femur, dislocation of, 234
— fracture of lower articular surface of, 241
— subperiosteal resection of, 266
Fergusson, modified lithotomy, 215
Fern, male, action of, 477
Fever, hay, 65
— puerperal, 417
— traumatic (Billroth), 226
— do. (Pick), 227
— typhoid, epidemic of, 492
— do., on, 61
— typhus, experiments on, 60
— yellow, in Mexico (Schmidtlein), 59
Fevers, fatty changes in (Concatto), 69
— malarial, 57
— two specific, at once, 63
Fibroid tumours of uterus, absorption of, 380
Fick, on rigor mortis, 24
Fiddes, on acupressure, 211
Finck, case of ulcerative endocarditis, 139
Fistula, utero-intestinal, 410
— vesico-intestinal, case of, 305
Fitzpatrick, treatment of disease of joints, 259
Flint, on epilepsy, 88
Foehr, treatment of alcoholism, 57
Fœtation, extra-uterine, 392
Fœtus, changes of posture of, 401
— urine of, 419
Foot, surgery of the, 250
Forceps for fixing the eyeball, 358
— obstetric forms of, 402
Forster, on acupressure, 211
Fort (Le), treatment of syphilis, 48
Foster, on phthisis, 131
Fox (Wilson), inoculation of tubercle, 35
Fracture of lower articular surface of femur, 241
— of ribs, fragment in lung, 242
— of lower jaw (Hill), 238
— of neck of scapula, 240
Fracture of the spine (Bryant), 276
— ununited treatment of (Birkett), 259
Frank, poisoning by prussic acid, 451
Frankenhauser, nerves of muscle, 24
Fräntzel, spiral fibres of sympathetic, 21
Fraser, experiments on poisons, 441
— poisoning by Calabar bean, 456
Fungus in rheumatism (Salisbury), 40
— in saliva (Losch), 7

Gairdner, alcohol in acute diseases, 69
— on presystolic bruit, 135
Galezowski, retina in tuberculosis, 39
— tubercular deposits in choroid, 364
Gall-stones pressing on vena cava, 184
Galvanism. See *Electricity*.
Gamgee, on acupressure, &c., 213
— physiology of the blood, 5
— poisoning by carbonic oxide, 459
Ganglia, sympathetic, structure of (Fräntzel), 21
Ganglion, spheno-palatine (Prévost), 20
Gases, inhalation of, influence on respiration (Hermann), 14
Gastralgia, arsenic in (Leared), 93
Gee, enlargement of spleen in congenital syphilis, 187
— tubercular meningitis, 84
Gerhardt, catarrh of larynx, 104
Gerlach, preparation of sections of spinal cord, 2
Gintrac, case of syphilis, 43
— on syphilitic phthisis, 131
Giraud-Teulon, a new fixed ophthalmoscope, 367
Gland, parotid, extirpation of (Weber), 218
Glands, salivary, physiology of (Heidenhain, &c.), 6
Glaucoma, authors on, 375
— cause of (Adamiuk), 364
Glossitis, epidemic of, 436
Goitre, exophthalmic, 365
Gold, chloride of, use of (Cohnheim and Gerlach), 2
Goltz, abdominal concussion, 20
Gonorrheal rheumatism in females, 320
Gout, causes of (Charcot), 49
Graefe, von, extraction of cataract, 351, 356
Greene, removal of a cervical tumour, 218
Grenser, albuminuria during pregnancy, 390
Griesinger, on epilepsy, 89
Gross, new operations for osseous anchylosis, 256
— wound of internal jugular vein, 283
Grünfeld, treatment of syphilis, 45
Guipon, on abdominal tumours, 178
Gull, absence of brain, 85

Gummata in lung, 43
Gummous tumour of eyeball, 346
Gunshot wound of abdomen, 326
— wounds, healing of, 325
Güterbock, temperature in cholera, 67
Gultman, on bromide of potassium, 476
— on veratria, 479
Guérin, treatment of syphilis, 48
Guy, sublimation of alkaloids, 460

Habershon, on ascites, 164
Hæmatemesis, fatal, case of (Bradley), 158
Hæmatocele of orbit, 344
— peri-uterine, 379
— peri-vaginal, 410
Hæmatoidin (Holm), 4
Hæmaturia, intermittent, cases of, 175
Hæmoglobulin, on (Preyer), 3
Hæmoptysis from aneurism of pulmonary artery, 129
Hæmorrhage in pregnancy, 408
— secondary, Hunterian operation in, 284
Hair, muscular fibre of crocodile, 23
Hamburger, auscultation of œsophagus, 152
Hamilton, case of dislocation at hip, 235
Hancock, surgery of the foot, 250
Hanging, suffocation from, 465
Harley (John), chorea, 87
— on belladonna, 481
— on conium, 480
— on hyoscyamus, 482
Hartnack, immersion lenses, 1
Haughton, force of a muscle, 24
Hausmann, decidua menstrualis, 378
Haviland, on cancer fields, 497
Hayden, non-organic mitral bruit, 137
Hay fever, 65
Health, public, report on (Stevenson), 485
Heart, action of, influence of heat on (Cyon), 11
— affections of, treatment by compressed air, 146
— bullet wounds of, 283
— cancer of, 138
— disease, prognosis in, 141
— effect of blow on abdomen on (Goltz), 20
— enlargement of, in pregnancy, 412
— gangrene of (Young), 137
— influence of vagi on (Lovén), 12
— innervation of (Cyon, Ludwig), 17
— irritable, 140
— muscular bundles of, 24
— pulsations, graphic process applied to, 146
— sounds of (Dogiel, Ludwig), 10
Heart, valves of, affections of, 133
— do., disease of, without murmur, 113
— white spots on, 140
Heat, animal, experiments on, 14
— developed during rigor mortis, 24
Heaton, seat of processes of oxidation, 14
Hecker, fatty degeneration in puerperal condition, 413
— rupture of uterus, 408
Heckford, peculiar form of scarlatina, 439
Hegar, membranes of ovum, 384
Heidenhain, on saliva of dog, &c., 6
Heinze, pneumonia, 115
Helmholtz, muscular sound, 24
Helminthiasis, 436
Hemeralopia, 363
Hemicrania, on, 99
Hemiplegia, case of, 72
— in children, 424, 427
— temperature in (Folet), 15
Henoch, on hemiplegia in children, 427
Henocque, case of bronchial concretion, 106
Heppe, on disinfection, 494
Herrgott, nævus of eyelid, 345
— on naso-pharyngeal polypus, 231
Hermann, electrical currents of muscle, 26
— on nitrous oxide, 193
— poisoning by curare, 456
— treatment of delirium tremens, 56
Hernia, internal, cure of (Bryant), 302
— radical cure of (Fayrer), 304
— subcutaneous rupture of stricture in (Larghi), 302
Hertz, case of gangrene of lung, &c., 116
Hicks, case of Cæsarian section, 406
— transfusion, 408
Higginbotham, alcoholic rheumatism, 56
Hill, fractures of lower jaw, 238
— valerian in hooping-cough, 111
Hillier, case of empyema, 107
Hinton, diagnosis of diseases of ear, 281
Hip-joint, amputation at the, 225
— do., for gunshot injury, 326
— dislocation at (Coote), 234
— do., in a child, 235
— do., irreducible, 235
— resection of, for gunshot wound, 326
Hippel, gummous tumour of eyeball, 346
Hitzig, inflammation of spinal cord, 94
Höche, death from cold, 470
Hoffmann, absorption by skin, 10
— case of constriction of bile-ducts, 184
Holm, hæmatodin, 4

Holmes, case of intussusception, 309
— excision of both elbows, 266
— report on surgery, 193
Holt's dilator, state of urethra after use of, 317
Honert, poisoning by nitro-glycerine, 452
Hoppe-Seyler, seat of processes of oxidation, 14
Hueter, subperiosteal excision of elbow, 265
Humerus, dislocation of, 236
— do., reduction of (Heine), 257
— fracture of, ununited tr atment of, 259
— subperiosteal resection of head of, 263
Humphrey, on treatment of wounds, 286
Hunterian operation in inflammation, &c., 284
Hutchinson, aphorisms on skin diseases, 188
— removal of foreign bodies from the ear, 283
Hydrocyanic acid, poisoning by, 451
Hydronephrosis, cases of, 179
Hygiene, legislation in connection with, 501
— report on (Stevenson), 485
Hymen, imperforate, 379
Hyoscyamus, action of (Harley), 482
Hypermetropia and strabismus, 372
— frequency of, 368
Hyposulphites in malaria, 59

Ice, use of, in typhoid, 63
Incubation of measles, 69
— of scarlatina, 68
— of smallpox, 68
Indigo, sulphate of, test for amyloid, 71
Infanticide (Breslau, Liman, Maschka), 468
Inflammation (Cohnheim), 51
— ligature of arteries in, 284—289
Influenza, diagnosis of, 66
— epidemic of, 66
Inglis, new form of forceps, 402
Injection, hypodermic, in mental disease, 76
— subcutaneous, of bichloride of mercury, 44
Inoculation of tubercle, 33—39
Insanity, cases of, 72
— delusion a test of (Ray), 473
— hypodermic injection in, 76
— moral (Boismont), 472
— statistics of, 471
Intercostals, action of (Cleland), 13
Intestinal concretions, 163
— obstruction, 165
Intussusception, case of (Holmes), 309
Iodine injection in enlarged glands, 330
— injection of, in spina bifida, 275
— in syphilis, 46
Iridectomy in cataract extraction, 354
Iris, authors on affections of, 374
Iritis, Calabar bean in, 350
Iron, perchloride of, injection of, in aneurism, 296
Irvine, excision of clavicle, 262

Jackson, on aphasia, 80
Jacobi, on croup, 102
Jacobson, pressure on veins in respiration, 12
Jassinsky, structure of placenta, 384
Jaundice during pregnancy, 390
Jaw, fractures of (Hill), 238
Jeaffreson, case of gall-stones, 186
Jenner, treatment of typhoid, 62
Joffe, melancholia from embolism, 74
Johnson, on typhoid, 61
Joint, ankle, excision of, 250
— hip, amputation at, 225, 326
— do., dislocation at, 234
— do., resection of, 326
— knee, amputation at, 223
— shoulder, dislocation of, 236
Joints, disease of, treatment of (Fitzpatrick), 259
— ligation of arteries in disease of, 284
Jolly, rupture of uterus, 409
Jones (Handfield), on case of prurigo with melancholia, 191
— (Handfield), cases of delirium, 77
— (Wharton), movements of lymphatic hearts, 10
Jurisprudence, report on (Stevenson), 441

Kamala in treatment of cysts of liver, 187
Keith, on acupressure, 211
Keloid, on (Fagge), 192
Kelsch, case of abdominal tumour, 178
Kidney, abscess of, case of, 175
— diseases of, authors on, 188
— do., urine in, 168
— elimination of alcohol by the, 5
— hydronephrosis of, 179
— report on diseases of, 29
— rupture of, tetanus after, 187
— sacculated, 179
— tumours of, diagnosed from ovarian, 177
Kinovic acid, 474
Kirchgasser, poisoning by arsenic, 446
Knapp, cases of extraction of cataract, 355
— dissection of eyes after death from puerperal fever, 364

Knapp, plastic operation on lower eyelid, 344
Knee-joint, amputation at (statistics), 223
— excision of, 266, 269
— ligature of femoral in wound of, 284
Kohler, detection of picrotoxin, 463
Kölliker, termination of bile-ducts, 8
König, on excision of knee, 267
Koster, on inflammation of the liver, 181
Koussin, 475
Krackowizer, case of vesico-intestinal fistula, 305
Krassilnikoff, syphilitic vaccination, 500
Kreatin, excretion of, 32
Kugel, on nystagmus, 362
Kusmaul, cases of disease of liver, 182
— paracentesis in pleurisy, 117

Labour, difficult, 397
— do., operations and instruments in, 402
— induction of, 406
— mechanism in, 395
Laburnum, poisoning by, 457
Lachrymal apparatus, authors on affections of, 374
— obstructions, treatment of, 348
Lagneau, unity of syphilis, 42
Lambe, cutaneous absorption of poisons, 445
Lancereaux, on adenoma of liver, 184
Language, faculty of (Jackson), 80
Larynx, catarrh of (Gerhardt, Steiner), 104
— tubercular affections of, 101
— ulcers of, sulphurous acid in, 45
Laurence, ligature of carotid in intra-orbital aneurism, 298
Lawson, case of sloughing after local anæsthesia, 215
— compression of abdominal aorta in inguinal aneurism, 295
Lazarewitch, induction of labour, 406
Lazzati, osteomalacia, 399
Lead poisoning, neuritis from, 362
Lebel, unity of sphilis, 42
Lebert, inoculation of tubercle, 34
Lee, on acupressure, 212
— on immunity of skin after long-continued irritation, 321
— on medio-lateral lithotomy, 216
Legroux, on digitalis, 477
Lens, authors on affections of, 374
— extraction of, with its capsule, 355
— regeneration of, 338
Lenses, immersion (Hartnack), 1
Litellier, poisoning by mushrooms, 457
Leucocythemia, excision of spleen in (Bryant), 221
Leucocythemia, urine in, 169
Leudet, on alcoholism, 54
Leven, caffeine and théin, 483
Lewin, treatment of syphilis, 44
Liebermeister, results of treatment of typhoid at Bâle, 62
Liebreich, composition of nervous tissue, 16
Liégey, poisoning by stramonium, 458
Ligature, distal, in aortic aneurism, 296
— of abdominal aorta, case of, 296
— of arteries in inflammation, 284—289
— of common femoral artery, 298
Liman, infanticide, 469
— on suffocation, 467
Lister, use of carbolic acid, 198
Lithotomy, case of, combined with lithotrity, 314
— immediate union after, 314
— median, cases of, 315
— medio-lateral (Lee), 216
— modified (Fergusson), 215
— statistics of (Thompson), 311
— suprapubic, case of, 314
Lithotrity, case of, combined with lithotomy, 314
— statistics of (Thompson), 311
Liver, abscess of, 181
— acute atrophy of, 183
— adenoma of, 184
— cysts of, treatment with kamala, 187
— diseases of, authors on, 188
— ducts of, termination of (Kölliker), 8
— fungus hæmatodes of, 183
— inflammation of, 181
— do. portal vein of, 185
— rupture of, tetanus after, 187
— suppurative inflammation of, 182
— waxy, symptoms and causes of (Dickinson, Murchison), 70
Lombard, influence of respiration on heat, 15
Longmore, on amputation at knee-joint, 223
Losch, on fungus in saliva, 7
Lotzbeck, on fractures of neck of scapula, 240
Lovén, on sensory and vaso-motor nerves, 12
Ludwig, on first sound of heart, 10
— on hyoscyamia, 483
Lung, fragment of rib in (Bruce), 242
— gangrene of, 116
— gummata in, 43
— ossification of, 117
— rupture of, with general emphysema, 332
— capacity of, after pregnancy, 384
Lymphatic hearts, movements of (Wharton Jones), 9

Lymphatics, distribution of (Schweigger-Seidel), 9

Maclean, on spots on heart, 140
Macnamara, ligature of common femoral, 298
Male fern, action of, 477
Manipulation in dislocations, 234
Mapother, case of general emphysema from rupture of lung, 332
— complete compression in aneurism, 292
Marcet, inhalation in phthisis, 128
— on nitrous oxide, 195
Marey, rapidity of muscular contraction, 25
— rapidity of nerve impulse, 17
Marmé, on cadmium, 445
— on thallium, 463
Marsh, case of abnormal development of diaphragm, 108
Marston, iodine injection in enlarged glands, 330
Martin, on baobab, 475
— obstetric weights and measurements, 396
— turning in contracted pelvis, 403
Martini, trephining of skull, 272
Maschka, infanticide, 470
Masons, diseases in (Feltz), 498
Materia medica, report on (Stevenson), 474
Matteucci, force of muscular contraction, 25
Maudsley, faculty of speech, 81
Maunder, on ligature of femoral in inflammation of knee, 288
Mayer, occurrence of menstruation in different races, 377
Measles and scarlet fever at once, 64
— incubation of, 69
Medicine, report on (Anstie), 33
Medicines, absorption of, by rectum (Demarquay, Savory), 10
Meissner, origin of uric acid, 32
Melancholia from embolism (Joffe), 74
— syphilitic (case), 44
— with prurigo, 191
Melchiorj, on amputation of thigh, 224
Meningitis after fracture of the skull, 272
— in children, 424
— tubercular (Gee, Mettenheimer), 84
— do., neuritis in, 39
Menstruation, period of occurrence of, &c., 377
Mercury, administration of, after trephining of the skull, 273
— bichloride of, in syphilis, 44
— use of, in syphilis (opinions on), 46
Meschede, case of syphilis, 42
Mesentery, fatty tumour of, 221
Metacarpus, dislocation of, 237
Methylene, bichloride of, 196
Mettenheimer, tubercular meningitis, 85
Meyer, abscess of brain, 86
— amaurosis from lead poisoning, 362
Microscopic sections, treatment of, 1
Midwifery instruments, 407
— report on (Barnes), 377
Miller, case of suppression of urine, 174
Milliot, on regeneration of lens, 339
Miners, diseases of (Poleck), 497
Monsters, 420
Monti, measles with scarlet fever, 63
Moutard-Martin, epidemic of influenza, 66
Moore, dementia and thoracic aneurism, 72
— inadequate operations for cancer, 230
Morphia, effects of, 443
— in asthma, 108
Morse, on dysentery, 162
Morphosis, on (Fagge), 192
Moxon, on speech, 81
Müller, chronic diarrhœa of children, 159
— diarrhœa in children, 437
Murchison, diarrhœa in typhoid, 62
— temperature in rheumatism, 41
— waxy degeneration, 70
Murray, compression under chloroform in aneurism, 292
Muscle, electrical currents of, 26
— force of a (Haughton), 24
— force of contraction of, 25
— force of, in proportion to temperature, 24
— latent excitation of, 24
— nerves of, 24
— regeneration of (Hofmann, Weber), 24
— report on, 22
Muscles, hypertrophy of, in a child, 432
— ocular, authors on, 376
— do., disorders of, 361
Muscular atrophy, progressive (Fagge), 95
— contraction, chemistry of, 27
— do., force of (Matteucci), 25
— do., rapidity of (Marey), 25
— degeneration with paralysis, 335
— fibres, spiral (Rouget), 23
— sound (Helmholtz), 24
Mushrooms, poisoning by, 457
Mussy, on cough, 113
Myopia, frequency of, 369
Myxoma of ovum membranes, 386

Nævi, injection of iron in, 422
Nævus, enucleation of (Teale), 301
— of nose and eyelid, 345
Narcein, action of, 477
Narcotism, alcoholic, 330

Nares, posterior, foreign body in, 233
— do., plugging of, 232
Nash, strychnine in ague, 57
Nerve, anterior crural, tumour of, 278
— do., removal of large portion of, 278
— buccinator (Turner), 21
— cardiac accelerator (Cyon), 18
— depressor, of arterial pressure (Cyon), 18
— facial, connection of, with lesser petrosal, 21
— fifth, influence of, on eyeball, 342
— lesser petrosal (Bischoff), 21
— median, wound of (Richet), 279
— musculo-spiral, removal of portion of retained sensibility, 281
— recurrent laryngeal, influence of, on respiration (Burkart), 13
— sciatic, inflammation of sheath of (Fayrer), 277
— do., neuritis of (Fayrer), 89
— superior laryngeal, influence of, in circulation (Aubert and Roever), 19
Nerves, ciliary, division of, to prevent sympathetic ophthalmia, 361
— influence of, on salivary glands, 6
— optic, authors on affections of, 375
— pneumogastric, influence of, on circulation (Ainser, Lohe), 12
— sensory, influence on vaso-motor (Lovén), 12
— spheno-palatine (Prévost), 20
— spinal, origin of rheumatism (Day), 40
— splanchnic, influence of (Cyon, Ludwig), 17
Nervous action, nature of (Hermann), 28
— diseases, authors on, 100
— do., pulse in, 150
— do., quinine in, 97
— do., report on, 72
— system, report on physiology of, 16
— tissue, protagon in (Liebreich), 16
— transmission, rapidity of (Marey), 17
Neumann, on carbolic acid, 476
Neuralgia, electricity in (Benedikt), 94
— epileptiform, case of (Ramskill), 93
— on (Anstie), 91
Neuritis from lead poisoning, 362
— in meningitis, 39
— of sciatic nerve (Fayrer), 89
Neurotic atrophy of face (Bärwinkle), 90
Nicotia, action of, 444
Niemeyer, on varieties of phthisis, 121
Nipple, supernumerary, 379
Nitrogen, elimination of (Parkes), 29
Nitro-glycerine, poisoning by, 452
Nitrous oxide, 193
Nothnagel, on causes of cough, 111
Nunneley, on acupressure, 214
Nyctalopia, 363
Nystagmus, on (Kugel), 362
Nyström, poisoning by nitro-glycerine, 453

Obstetric instruments, 407
Obstetrics, report on, 377
Œsophagotomy for removal of foreign bodies, 221
Œsophagus, auscultation of (Hamburger), 152
— case of enlargement of, 154
— paralysis of, in children, 154
Ogle, action of atropine on animals, 458
— cases of chorea, 88
Ointments, absorption of, by skin (Clemens, Ritter), 10
Ollier, subperiosteal excision of os calcis, 271
— subperiosteal resection, 263
Ophthalmia, sympathetic, division of ciliary nerves in, 361
Ophthalmic surgery, report on (Carter), 338
Ophthalmoscope, fixed, a new (Giraud-Teulon), 367
Ophthalmoscopy, authors on, 376
Opium alkaloids, action of, 484
— hypodermic injection of, 76
— new alkaloid in, 475
Optic nerves, authors on affections of, 375
Oppolzer, on diabetes, 170
Orbit, authors on affections of, 374
— hæmatocele of, 344
— tumours of, 345
Os calcis, excision of, 255
— subperiosteal resection of, 270
Osteomalacia, lactic acid in, 399
Oulmont, on veratrum, 478
Ovarian dropsy simulated by cyst of kidney, 181
— tumour complicating pregnancy, 397
— tumours, diagnosis of, 177
Ovaries, cancer of, 138
Ovariotomy, cases of, 382
Ovum, hydatiginous degeneration of, 385
— membranes, structure of (Hegar), 384
— do., myxoma of, 386
Oxidation, seat of processes of, 14
Oxygen, influence of, on respiration, 13

Panas, treatment of syphilis, 48
Pancreas, action of, &c. (Kuhne), 8
Paracentesis thoracis in children, 107
— in pleurisy (Kussmaul), 117
Paralysis, agitans, 186
— general, (case, Stone), 73
— hysterical, 97
— motor, in children, 429
— one-sided spinal (Rosenthal), 96
— scriveners' (Solly), 276

Paralysis, scriveners', apparatus for, 335
— simulation of, 471
— with muscular degeneration, 335
Parkes, elimination of nitrogen, 29
Parotid gland, extirpation of (Weber), 218
Peacock, cases of heart disease, 135
Péan, case of extirpation of spleen, 220
Pelvic cellulitis, 379
Pelvis, deformities of, 398
— measurements of diameters of, 395
Perrin, treatment of syphilis, 46
Petechiæ, amputation at the hip-joint, 225
Pettenkofer, on cholera, 490
Pflüger, on respiration, 13
Phimosis, dilatation of prepuce for, 317
Phlegmasia dolens, 416
Phosphorus, poisoning by, 448
Phthisis and syphilis (case), 43
— contagion of (Windrif), 126
— distribution of, 494
— fibroid (Clark), 124
— in children, 435
— inhalation in (Marcet), 128
— pneumonic (Sanderson), 120
— propagation of (Bergeret), 498
— syphilitic, 131
— varieties of (Niemeyer), 121
Physiology, report on (Power), 1
Pick, on traumatic fever, 227
Picrotoxin, detection of, 463
Pirrie, on acupressure, 208
— use of carbolic acid in burns, 334
— (Dr.) on hay fever, 65
Placenta, hydatiginous degeneration of, 386
— structure of, 384
— prævia, 408
Playfair, thrombosis of pulmonary artery, 144
Pletzer, case of abnormal fœtation, 394
Pleurisy in children (Henoch), 434
— paracentesis in (Kussmaul), 117
Pneumonia and tuberculosis (Beckler), 115
— head symptoms in (Heinze), 115
— leading to phthisis, 120
— pathology of (Waters), 115
— sputa in (Böhme), 114
— treatment (Sieveking), 116
Pneumothorax, pyo- (Boisseau), 131
— tubercular (Powell), 131
Poisoning by arsenic, 446
— atropine, 458
— bundu and akazga, 454
— cadmium, 446
— Calabar bean, 456
— carbonic oxide, 459
— hydrocyanic acid, 451
Poisoning by laburnum, 457
— mushrooms, 457
— nitro-glycerine, 452
— phosphorus, 448
— stramonium, 458
Poisons, chemical action of (Broadbent), 445
— chemical experiments with (Brown and Fraser), 441
— cutaneous absorption of (Roussin), 444
— excretion of (Lambe), 445
— tests for, 460
Poleck, diseases of miners, 497
Polypus, naso-pharyngeal, laryngoscope in (Hergott), 231
— do., subperiosteal operation for, 232
— uteri, 381
Poppel, case of abnormal fœtation, 393
Potash, bichromate of, in syphilis (Dolbeau, Le Fort), 46, 48
Potassium, bromide of, in alcoholism, 57
— do., experiments with, 476
— cyanide of, poisoning by, 451
— iodide of, absorption of, by the rectum (Demarquay), 10
— do., in syphilitic phthisis, 43
Power (H.), report on physiology, 1
Pregnancy, albuminuria in, 388
— amaurosis in, 388
— capacity of lungs after (Dohrn), 384
— diagnosis of, 383
— diseases occurring with, 391
— extra-uterine, 392
— with smallpox, 391
Pregnant women, diseases of, 387
Prévost, on spheno-palatine ganglion, 20
— on veratria, 478
Preyer, cause of poisonous action of prussic acid, 451
— on curare, 455
— on hæmoglobulin, 3
Priapism, persistent, cases of, 317
Prinz, tubercular affections of larynx, 101
Protagon, on (Liebreich), 16
Prurigo with melancholia, 191
Public health, legislation in connection with, 501
Puerperal convulsions, 416
— fatty degeneration, 413
— fever, 417
— do., affections of eyes in, 364
— state, condition of heart in, 412
— do., temperature in, 412
Pulmonary hæmorrhage (Niemeyer), 124
Pulse, irregular, 140
Pupil, instrument for measuring diameter of, 350

Pupillary membrane, remnants of, 350
Purdon, sulphurous acid, use of, 45
Pyæmia (Billroth), 226
— puerperal, 417
Pyo-pneumothorax, 131
Pyrosis (Lawson), 157

Quain, case of separation of lower epiphysis of tibia, 257
Quinine in ague, 57
— in periodical nervous diseases, 97

Ramskill, epileptiform neuralgia, 93
Raven, dislocation of metacarpus, 237
Ray, on delusion in insanity, 473
Rectum, absorption by, 10
— heat of, while in bath (Schuster), 16
Refraction, authors on, 374
— ocular, state of, in schools, &c., 368
Reissner, hypodermic injection in insanity, 76
Resection, subperiosteal, 263
Respiration, influence of movements of, on circulation (Burdon-Sanderson), 11
— influence of, on heat (Lombard), 15
— influence of oxygen on (Pflüger), 13
— do. recurrent laryngeal on (Burkart), 13
— organs of, authors on diseases of, 133
— pressure on veins in (Jacobson), 12
— report on physiology of, 13
Retina, anæsthesia of, 360
— authors on affections of, 375
— case of pigmentation of, 365
— in tuberculosis (Galezowski), 39
Rheumatism from alcoholism (Higginbotham), 56
— fungus in (Salisbury), 40
— gonorrheal, in females, 320
— nervous origin of (Day), 40
— report on, 40
— temperature in (various), 40
Richardson, on bichloride of methylene, 196
Richet, wound of median nerve, with sensibility in supplied parts, 279
Rickets, congenital, 421
Rigaud, excision of os calcis, 271
Rigor mortis, development of heat during, 24
Ringer, temperature in rheumatism, 40
Ritter, absorption by skin, 10
Roberts, case of aneurism, 142
— do. Cæsarian section, 406
— do. fungus hæmatodes of liver, 184
— do., hydronephrosis, 179
— do. suppression of urine, 174
— test for quantity of sugar in urine, 173
Robertson, cases of aphasia, 83
Rogow, action of Calabar bean, 340
Roscoe, spectrum analysis of blood, 5
Rose, case of cyst of kidney, 181
Rosenthal, one-sided spinal paralysis, 96
Roussin, detection of seminal stains, 465
— cutaneous absorption of poisons, 444
Roustan, inoculation of tubercle, 34

Sachs, absorption of fats, 7
Salisbury, fungus in rheumatism, 40
Saliva, fungus in (Losch), 7
— of dog, &c. (Heidenhain, Eckhard, &c.), 6
Salivary glands, influence of nerves on, 6
Sallkowski, vaso-motor nerves of ear, 21
Salt, influence of, on urine, 31
Salter (Hyde), on asthma, 110
Sanderson (Burdon), inoculation of tubercle, 35, 37
— temperature in rheumatism, 41
— on pneumonic phthisis, 120
— treatment of dyspnœa, 145
Santesson, injection of iron in nævi, 422
Sappey, on muscular protrusion of eyeball, 340
Sarcinæ in urine, 169
Savory, removal of portion of musculospiral nerve, 281
Scapula, neck of, fractures of, 240
Scarlet fever and measles at once, 63
Scarlatina, epidemic waves of (Ballard), 497
— incubation of, 68
— peculiar form of (Heckford), 439
— puerperal, 419
Scheiss-Gemuseus, cases of injury to eye, 359
— periodic diplopia, 362
Schiff, on act of vomiting, 7
— influence of fifth nerve on eyeball, 342
Schmidtlein, on yellow fever, 59
Schraube, poisoning by phosphorus, 449
Schramm, malarial fever, 58
Schuster, influence of bath on temperature, 16
Sciatica, case of (Fayrer), 277
— incision in (Fayrer), 89
Scott, chloroform in malaria, 59
Scriveners' palsy (Solly), 277
— do., apparatus for, 335
Schroeder, measurement of pelvis, 395
Seegen, elimination of nitrogen, 31
Seminal stains, detection of, 465
Sensation, recovery of, after removal of large portions of nerve, 278—281
Septicæmia (Billroth), 226
Serous membranes, lymphatics of, 9
Shoulders, dislocation of both, 236
Sieveking, pneumonia, 116
Simon, cases of lithotomy, 314

Simon, healing of gunshot wounds, 325
— inoculation of tubercle, 33
— on cholera, 489
Simpson, case of hydronephrosis, 180
— presystolic bruit, 136
Simulation of epilepsy, 470
— of paralysis, 471
Skin, absorption by, 10
— diseases of, authors on, 192
— do., aphorisms on (Hutchinson), 188
— do., classification, &c. (Allbutt), 189
— disease of, with melancholia (Jones), 19
— immunity of, after prolonged irritation, 321
Skull, trephining of, 272
Smallpox during pregnancy, 391
— incubation of, 68
Smell, loss of, from local etherisation, 84
Smith (Angus), on disinfectants, 495
— cryptopia, 475
— (Protheroe), on tetrachloride of carbon, 196
— (T.), on staphyloraphy in children, 231
— (W.), case of syphilis, 44
Solly, on scriveners' palsy, 276
Sonnenschein, on blood-stains, 464
Spectroscopy of bile, 182
— of blood-stains, 464
Spectrum analysis of bile, 8
— do. of blood, 4
Speech, action of brain in, 81
— loss of (Jackson, &c.), 80
Spence, removal of a cervical tumour, 216
Sphygmograph in simulated epilepsy, 470
— use of, 146
Spiegelberg, mechanism of labour, 395
— ovarian tumour with pregnancy, 397
Spina bifida, injection of, with iodine, 275
Spinal cord, changes in, in tetanus, 328
— do., inflammation of (Hitzig), 94
— do., sensibility of (Engelken), 22
— do., sections of, preparations of (Clarke), 2
— paralysis, one-sided (Rosenthal), 96
Spine, fracture and dislocation of the (Bryant), 275
— lateral curvature of (Barwell), 244
Splanchnics, influence of (Cyon), 17
Spleen, enlargement of, in congenital syphilis, 187
— extirpation of (Péan, Bryant), 220
— gangrene of, 116
— rupture of, tetanus after, 187
Ssabinski, on suffocation, 467
Staphyloma, posterior, frequency of, 371
Staphyloraphy, chloroform during (Collis), 231
— division of muscles in (Callender), 231
— gag for (Smith), 231
Staphyloraphy in children (Smith), 231
Steffan, operation for cataract, 351
Steiner, catarrh of larynx, 105
— on croup, 103
— measles with scarlet fever, 64
Stevenson, poisoning by prussic acid, 451
— report on jurisprudence, 441
— do. materia medica, 474
— do. public health, 485
Stewart (Grainger), case of gastritis phlegmonosa, 186
— dilatation of bronchi, 117
Stimulants in acute disease (Gairdner), 70
Stomach, ulcer of, Carlsbad waters in, 156
— do., trichinæ a cause of, 156
Stone (Domett), general paralysis, 73
Stork, case of croup, 103
Strabismus and hypermetropia, 372
— effect of enfeebled accommodation, 361
— without hypermetropia, 373
Stramonium, poisoning by, 458
Strangulation, internal, of bowel, case of, 302
Strychnia, effects of, 443
Strychnine in ague, 57
Stuart (Alexander), ciliary motion, 22
Suffocation (Tardieu) 465
— blood-spectrum after, 468
Sugar in urine, tests for, 171
Sulphur in diphtheria, 66
Supra-renal capsules, disease of, in congenital syphilis, 423
Suppuration and waxy degeneration, 70
Surgery, report on (Holmes), 193
Sustschinsky, action of vagus on the heart, 20
Sutton, abscess of brain, 85
Syme, on carbolic acid treatment of wounds, 200
— on torsion, 205
Sympathetic ganglia, structure of (Fräntzel), 21
— influence of sensory nerves on (Lovén), 12
— pathology of (Eulenberg, Guttmann), 99
Syphilis, authors on, 49
— cases of, 42—44
— congenital, 423
— do., enlargement of spleen in, 187
— duality of, 42
— in animals, 324
— muscular contraction with, 424
— treatment of, 44
Syphilitic deposits in viscera (cases), 42—44
— vaccination, 500
Syphilization, cases of, 320

Talko, case of anæsthesia retinæ, 360
Tardieu, on suffocation, 465
— simulated paralysis, 471
Tarsus, excision of whole, 272
Tait, on complete arrest of circulation in aneurism, 293
Taylor, on blood-stains, 464
— extraction of cataract, 358
Teale, enucleation of nævus, 301
Temperature in rheumatism, 40
— experiments on, 14
— in cholera (Güterbock), 67
— of head in intellectual exertion (Lombard), 16
— influence of, on action of heart (Cyon), 11
— in puerperal state, 412
Tension, ocular, measurement of (Dor), 340
Testa, on Cæsarian section, 405
Tetanic convulsions in a young child, (Vogel), 98
Tetanus after abdominal injury, 187
— case of (Andrews), 98
— changes in spinal cord in, 328
Thallium, detection of, 463
Thebaia, effects of, 443
Théin, action of (Leven), 484
Therapeutics, report on (Stevenson), 474
Thigh, amputation of, leaving patella, 224
Thrombosis in puerperal state, 415
— of pulmonary artery, 144, 432
— of sinuses of head in children, 426
Thudichum, spectroscopy of bile, 9
— spectrum analysis, 5
Tibia, osteo-aneurism of, 242
— separation of lower epiphysis of (Smith), 257
Tigri, diagnosis of influenza, 66
Tongue, ligature of arteries of, 297
Toulmouche, wounds of genitals, 465
Torsion (Syme, Humphrey, Bryant), 205
Tracheotomy for croup (Jacobi, Steiner), 102
— do. (cases), 234
— in aortic aneurism, 141
Transfusion (Hicks), 408
Trephining of skull, 272
Trichinæ in ulcer of stomach, 156
Tubercle, inoculation of, 33—39
Tubercular deposits in choroid, 364
— diseases of larynx, 101
— meningitis (Gee, Mettenheimer), 84
Tuberculosis, authors on, 39
— by inoculation, 33
— inheritance of, 123
— of uterus, 381
Tumour of abdominal wall, 164
Tumour of anterior crural nerve, 278
— cervical, removal of a (Spence), 216
— do. (Greene), 218
— fibrous, of orbit, 345
— melanotic, of orbit, 346
Tumours, abdominal, cases of, 178
— diagnosis of renal and ovarian, 177
— removal of, by electrolysis (Althaus), 201
— of uterus, 380
Turenne, syphilis in animals, 324
Turner, buccinator nerve, 21
Turning, use of, in contracted pelvis, 403
Typhlitis stercoralis, 436
— do. (Bierbaum), 161
Typhoid at Guildford, 63
— epidemic of, 492
— on, 61
— with typhus, 64
Typhus, experiments on (Zorn), 60
— with typhoid, 64

Umbilical cord, replacement of, 402
Urea, elimination of, 29
— origin of (Meissner), 31
— in proportion to temperature (Voit-gensen), 14
Urethra, state of, after use of Holt's dilator, 317
Uric acid, mode of estimating amount of, 169
Urine, allantoin in, 32
— elimination of nitrogen by (Parkes), 29
— do. alcohol in, 5
— authors on the, 188
— condition of, with kidney disease, 168
— influence of salt on, 31
— of fœtus, 419
— report on, 31
— sugar in, tests for, 171
— suppression of, 415
— do., cases of, 174
— do., digitalis in, 174
Uterine artery, aneurism of, 410
— sound, passage of, along Fallopian tubes, 381
Uterus after delivery, 412
— bifid, pregnancy in, 394
— chronic inversion of, 382
— condition of, in obstructed labour, 395
— decidua menstrualis of, 378
— on inversion of (Duncan), 411
— do., chronic (Woodman), 410
— mouth of, occlusion of, 397
— neck of, amputation of, 381
— removal of, 381
— retroversion of gravid, 389
— rupture of, 408
— do., spontaneous, 409
— tuberculosis of, 381

Uterus, tumours of, 380

Vaccination, syphilitic, 500
— from animals (Ballard), 499
Vaccine virus, nature of (Chauveau), 66
Vagina, defective formations of, 379
— laceration of, 410
Vaginismus, 380
Valerian in hooping-cough, 111
Vanzetti, on digital compression, 289
Variola identical with varicella, 439
Vein, portal, inflammation of, 185
— internal jugular, wound of, 283
Veins, communications of, with arteries (Bernard), 11
— pressure on, in respiration (Jacobson), 12
Velpeau, mercury in syphilis, 47
Vena cava, case of pressure on, 184
Venereal ulcer, mixed, cases of, 323
Veratrum, action of, 478
Verneuil, plugging posterior nares in operations on the face, 232
— treatment of syphilis, 46
Vesical mucous membrane, loss of portions of, 411
Vesico-intestinal fistula, case of, 305
Villi, absorption by (Sachs), 7
Virchow, interstitial encephalitis, 78
Viseur, treatment of cholera, 67
Vision, authors on, 376
Vitreous, authors on affections of, 375
— moving body in (Fano), 365
Vivenot, compressed air, experiments with, 145
Vogt, time of menstruation in Norway, 377
Voisin, test for curarin, 456
— simulated epilepsy, 470
Voisin, action of curare on eye, 340
Volckmann, case of excision of knee, 270
— fracture of lower articular surface of femur, 241
— gunshot wounds of abdomen, 326
Vomiting, act of (Schiff), 7

Wade, on alcoholic narcotism, 328
Waldenburg, inoculation of tubercle, 35
Ward (Montgomery), typhus with typhoid, 64
Waters, pneumonia, 115
Waxy degeneration (Murchison, Dickinson), 70
Weber, extirpation of parotid gland, 218
— on osteomalacia, 399
— temperature in rheumatism, 41
Weigelin, elimination of nitrogen, 30
Wells, diagnosis of renal and ovarian tumours, 177
Werber, poisoning by nitro-glycerine, 453
Werigo, on coniin, 480
Wertheim, unity of syphilis, 42
Wilks, case of syphilis, 43
Willett, cases of acupressure, 212
Williams, on pulmonary phthisis, 129
Wilson, acute atrophy of liver, 183
Windrif, contagion of phthisis, 126
Wolfe, artery forceps, 214
Woodman, case of inversion of uterus, 410
— supernumerary nipple, 379
Wounds, jurisprudence of, 465
— treatment of, 198, 205

Young, case of gangrene of heart, 137

Zorn, experiments on typhus, 60

PRINTED BY J. E. ADLARD, BARTHOLOMEW CLOSE.

BINDING SECT. AUG 11 1971

R
101
N49
v.2

New Sydenham Society
A biennial retrospect of medicine

Physical &
Applied Sci.

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY